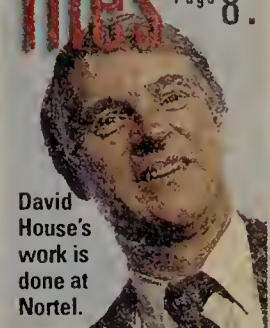


The newswweekly of enterprise network computing

# NetworkWorld

**House flies** Page 8.



David House's work is done at Nortel.

June 21, 1999 Volume 16, Number 25

The network portal: [www.nwfusion.com](http://www.nwfusion.com)

## CIM creeps even closer

**The Common Information Model is already paying dividends, but more vendors need to get on board.**

BY ELISABETH HORWITT

**G**uy Wood, chief information officer of Internet Banking Communications, had never heard of the Common Information Model when he bought Manage.Com's FrontLine Manager to handle his firm's mixed bag of electronic commerce systems. But he is, nevertheless, one of the few network professionals who can testify to CIM's strengths as an integration enabler for enterprise management.

FrontLine Manager, now known as Frontline FastStart, provides all the proactive, integrated and graphical user interface-based management capabilities offered by enterprise frameworks such as Tivoli's NetView and Computer Associates' Unicenter TNG. Yet FrontLine FastStart only costs about \$15,000, instead of \$100,000. Furthermore, it took Wood only an hour, rather than months, to deploy the platform.

See **CIM**, page 59

## Java heats up across enterprise networks

*Big shops talk up their Java applications at annual JavaOne conference.*

BY JOHN COX

**SAN FRANCISCO** — Java critics used to cackle whenever the language was touted as an enterprise technology. But corporations weren't laughing last week at Sun's annual JavaOne conference. Instead, they were bragging about how Java is energizing critical enterprise applications.

How critical? One company, Instinet Corp., said it is using a Java system to move into the trillion-dollar market for government securities. Other corporate Java believers at the show included Charles Schwab & Co., DHL Worldwide Express and The Home Depot.

"The Java platform is now the mainstay for enterprise

computing and is rapidly moving into consumer markets," declared Alan Baratz, head of Sun's Java software group, in a keynote speech on the first day of the four-day event.

While the show lacked blockbuster product news, Sun did roll out Java 2 Enterprise Edition, a package

of APIs and services needed to build enterprise-scale distributed Java applications. The package had been eagerly awaited by corporate and commercial developers (NW, June 14, page 10).

In all, JavaOne attracted about 20,000 programmers, up See **Java**, page 16

**"Every new application at DHL is pushed toward being written in Java, unless there is a compelling reason not to."**

Oliver Deschryver, director of Web architecture, DHL



PHOTO COURTESY: MAST PHOTOGRAPHY FOR SUN MICROSYSTEMS, INC.

## Virtual private nets show QoS no respect

BY JIM DUFFY  
AND TIM GREENE

Users looking for quality of service from their VPNs may

be in for a rude awakening.

It may be difficult for service providers to differentiate QoS on virtual private networks (VPN) built with

encrypted tunnels because encryption scrambles the data in the IP packet vital for defining and requesting QoS from the network, say analysts and other observers.

"It is one of the key issues, and it is one of the arguments that says to me that VPNs as a service may not make sense," says John Freeman, an analyst at Current Analysis in Sterling, Va.

"It's hard to classify the traffic when you can't look into the packet," says Dave Passmore, See **QoS**, page 93

## UUNET plots VPN course

BY DENISE  
PAPPALARDO

UUNET plans to add strong security and greater network access control to its dial-up VPN services by year-end.

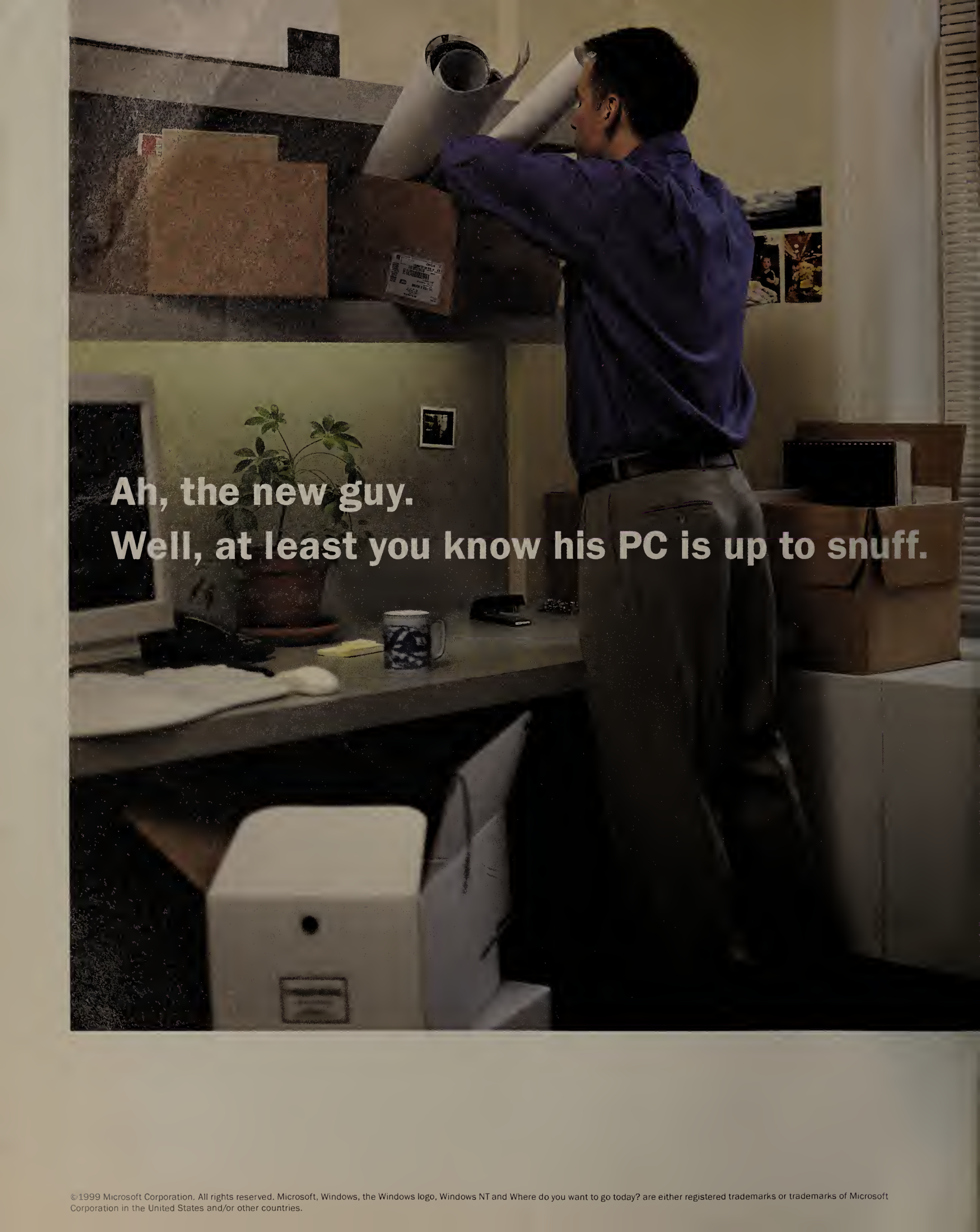
UUNET, MCI WorldCom's ISP business, will add support for integrated directory services, IP Security (IPSec) software, public-key infrastructure (PKI) and new customer premise virtual private net- See **UUNET**, page 92

More **Online**

- Our discussion on whether you should outsource your VPN or build your own.
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## THIS WEEK ONLINE



### Keeping Current.

When is a cable company not a cable company? When it's a phone company, of course. Fred McClimans takes a look at the current legal wrangling over AT&T and its new cable operations. Does he think AT&T should be forced to open up all those fibers to competitive carriers, just like a regional Bell operating company? **DocFinder: 3427**

**Opening up cable.** What do you think? We've set up a forum on the convergence of cable and data, based on a court ruling involving those AT&T cable operations. Should AT&T be forced to let competitors use its cables? **DocFinder: 3438**

**DWDM.** We've set up a Net-Resources page on dense wave division multiplexing. You'll find *Network World* primers and news as well as explanatory documents and white papers from all over the Internet. **DocFinder: 3439**

**High-speed LANs.** Gigabit Ethernet vs. ATM. High-speed token ring. Layer 3 switching. Layer 4 switching. Routing switches. Whew! Keep up to date with our free, twice-weekly newsletter, written by *Network World* Senior Editor Jeff Caruso. **DocFinder: 3440**

**International news.** Want to stay current on the latest IT news from around the world? In cooperation with the IDG News Service, we have a global news feed that lets you browse articles from six of the seven continents (sorry, no news from Antarctica yet!). **DocFinder: 3441**

**Chillin' out.** Features Managing Editor Amy Schurr shares some relaxation techniques she learned at GigaWorld. **DocFinder: 3442**

### How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

# NetworkWorld

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**STAFF:** See the masthead on page 16 for more contact information. **REPRINTS:** (717) 560-2001

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Guy Wood, CIO of Internet Banking Communications, is one user looking forward to the benefits promised by the Common Information Model for unified enterprise management. Page 1.



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AltiGen's AltiServ NT-based PBX and messaging system is well-suited for branch offices. Page 73.

**COOL TOOLS:** Lernout & Hauspie's VoiceXpress 4 Professional speech recognition software. Page 74.



## NEWS BRIEFS, JUNE 21, 1999

**3Com wireless venture takes flight**

The untethering of communications continues. 3Com and Aether Technologies last week said they would team to form OpenSky, a company that will offer wireless e-mail and Internet access services. OpenSky will be based in Palo Alto and will be under the wing of Patrick McVeigh, formerly head of sales and marketing for 3Com's Palm Computing Division.

Initially, OpenSky services, which should be available by year-end, will target Palm III and Palm V handheld devices. Services will also target devices that run Microsoft's Windows CE operating system. OpenSky plans to introduce services such as real-time e-mail access — including Web-based e-mail accounts like Yahoo's, and packages for Lotus Notes or Microsoft Exchange — by year-end.

**Real reason or conspiracy theory?**

Now that Craig Benson has resigned as president and CEO of Cabletron, industry gossips are starting to spin yarns about the real reason he stepped down. A particularly juicy tale involves Celestica, the Canadian company to which Cabletron is outsourcing its manufacturing operations. As the story goes, Benson was forced to resign two days after a Cabletron official smashed up some Cisco routers Celestica had recently purchased for its Exeter, N.H., facility to help the company manufacture Cabletron gear. This violent act supposedly scrapped the outsourcing deal, cost Cabletron \$50 million — the anticipated amount of first-year manufacturing savings — and forced Benson to call it quits.

Cabletron passes the story off as just another one of the conspiracy theories that usually surface whenever a high-level executive departs. A company spokesman says Cabletron and Celestica are a couple of weeks away from finalizing their outsourcing deal. Celestica did not return a phone call seeking comment.

**Cisco gobbles up No. 34**

The word "insatiable" pops to mind. Cisco last week said it has signed a definitive agreement to acquire privately held TransMedia Communications, a developer of packet-to-public switched telephone network gateways, for \$407 million in stock. Under the terms of the agreement, between 3.15 and 3.85 million shares of Cisco common stock

will be exchanged for all outstanding shares and options of TransMedia, which was founded in 1998. The transaction, which has been



approved by the boards of each company, is expected to close in the first quarter of Cisco's fiscal year 2000. The 66 TransMedia employees, including president and CEO Gwong-Yih Lee, will report to Brad Wurtz, vice president and general manager of Cisco's Multiservice-Switching business unit. TransMedia will be Cisco's 34th acquisition since 1993.

**AT&T moves to block cable open-access**

AT&T last week filed what it called an "expedited appeal" of a recent court ruling that threatens to upset its broadband cable access strategy. The carrier giant asked the U.S. Court of Appeals in San Francisco to quickly overturn a Portland, Ore., federal judge's ruling earlier this month forcing AT&T to open its cable lines to competitors. The judge's decision doesn't apply nationally, but AT&T lawyers say they fear that GTE and America Online are shopping "Portland clauses" to local cable franchising boards around the country, telling them the courts will now uphold open-access mandates. AT&T claims it may voluntarily invite ISPs to offer services over its cable lines but has insisted that the government not force it to do so. AT&T has threatened to delay high-speed cable-modem service if such a mandate is passed.

**When Windows NT fails**

For those worried about their Windows NT servers crashing — OK, you can put your hands down now — Computer Associates this week is unveiling software to transfer vital files to another server. SurviveIT will periodically copy files to a backup server, and then direct all traffic to the backup server when the primary server fails. The product costs \$2,500 for the primary and backup servers. In a flash of creative marketing, CA is calling the software Version 4.5, even though this is the first iteration of SurviveIT. The product ships next month.

**DSL dial-up company acquired**

Competitive local exchange carrier Allegiance Telecom of Dallas last week acquired ISP Kivex.com for \$34.5 million in cash. Kivex, based in Bethesda, Md., serves primarily commercial users in multitenant office buildings, utilizing dedicated and digital subscriber line dial-up Internet access services. Allegiance says the acquisition furthers its avowed desire to break into the DSL market in major cities.

# Compaq reshuffles, expects quarterly loss

BY DENI CONNOR

HOUSTON — Compaq this week finds itself in the unenviable position of going into PC Expo, one of the computer industry's biggest shows of the year, scrambling to explain its latest reorganization and more bad financial news.

In a press conference last week, Chairman and acting CEO Ben Rosen said Compaq expects to post a \$237 million loss for the quarter ending July

Each division will have a team dedicated to product development, marketing and field sales. Previously, teams shared the responsibilities.

Michael Capellas, Compaq's acting chief operating officer, said the reorganization would eliminate product and business overlap, shorten product time to market and cut a number of middle managers. He declined to say how many people the move would affect.

In explaining the firm's ex-

## Compaq reorganizes

Acting CEO Ben Rosen reorganized Compaq into three divisions aiming to tackle the company's woes.



**Enrico Pesatori**  
will lead Compaq's  
Enterprise Solutions  
and Services Group.



**Mike Winkler**  
will control the  
Personal Computer  
Group.



**Mike Larson**  
will head up the  
Consumer Group.

28 — a surprise to analysts who had predicted favorable results. Rosen also announced a reorganization that will leave the company with three distinct business units, each responsible for its own profit and loss.

Compaq merged its Services Group and Enterprise Computing Group into one unit, which will be run by former marketing executive Enrico Pesatori. The new group will be called the Enterprise Solutions and Services Group, and will also be charged with executing Compaq's NonStop eBusiness strategy, the firm's new electronic commerce initiative.

The Enterprise Computing Group was responsible for managing the server and storage divisions. The Services Group includes the Digital, Tandem and Compaq services organizations.

Compaq will leave intact the Personal Computer Group and the Consumer Group. Both target the low end of the market for desktop and handheld consumer devices.

pected income loss, Rosen said in essence that Compaq's prices are too high and its sales too low. Rosen also said the reorganization would cause a "significant" charge against earnings but would eliminate \$2 billion in operating costs this year. He refused to give details about the planned cost savings.

The hastily called press conference left analysts wondering why Compaq had even bothered delivering a mixed message of dismal results and reorganization. "The tone of the press call was like the ghost of Eckhard Pfeiffer. There wasn't much in terms of clear, decisive discussion of what Compaq was doing," says Roger Kay, an analyst at International Data Corp. in Framingham, Mass.

"The fact that there are two, three or four divisions ultimately will make little difference. From where I sit, Compaq's strategy has not been elucidated yet," adds Richard Chu, an analyst with S. G. Cowan, an investment banking firm in New York. ■



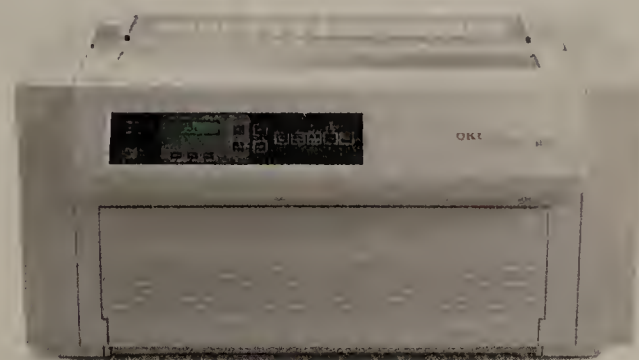
**Smashing rumors in Benson's wake.**





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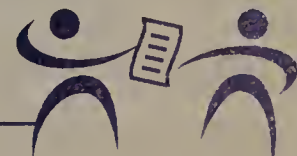
Its MTBF is 15,000 hours. The equivalent of 7 years and 3 months worth of 40 hour weeks of solid printing. (The Epson's MTBF is only 10,000 hours.) The Pacemark 4410 is rated for a workload of 35,000 pages per month, at 300 lines per minute. Seven years and 3 months times twelve months times 35,000 pages per month comes to 3,045,000 pages before failure. Our warranty is twice that of the Epson: 2 years on site for the printer, and 1 year on site for the printhead.

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# Nortel to build without House

*As expected, company prez bolts one year after Bay acquisition.*

BY JIM DUFFY

SANTA CLARA, CALIF. — When Dave House announced his resignation from Nortel Networks last week, those in the know weren't surprised. Many observers felt his position as president of the telecom giant was largely ceremonial all along.

House announced he would step down as president of Nortel one year to the day after Nortel announced it would acquire Bay Networks for \$9 billion. House had been chairman, president and CEO of Bay.

House says he will leave the company in 75 days — one year to the day after Nortel completed its acquisition of Bay. He will remain on the Nortel board.

Analysts say the timing is no coincidence. They say House essentially resigned his duties and gave up his power a year ago when he signed Nortel's letter of intent to acquire his company.

"Right on time," says Craig Johnson, principal at PITA Group in Portland, Ore. "The members of senior management in acquired companies usually get financial kickers if they stay around for a predetermined time. One year is about the right time for him to get his money."

Some users say House's departure won't leave a void.

"I'm not sure how hands-on he was in the past year anyway," says Brett Frankenger, systems engineer at Union Pacific Railroad in Omaha, Neb. "I don't think there will be much impact at all. I'm sure he knew this was coming for a long time."

Others will miss him.

"I was pretty surprised," says Fred Archibald, manager of computer sciences and electrical engineering at the University of California, Berkeley. "I think Dave was doing a great job."

Nortel says it has no plans to fill House's position, another indication that his tenure at the company was always intended to be temporary.

"Before the merger, I was

president and CEO, so I'll probably return to that," says Nortel CEO John Roth.

"House was not going to run Nortel," says PITA Group's Johnson. "He just doesn't have the abilities to run Nortel."

## Not about networking

Indeed, the technical savvy that House possesses in PCs and microprocessors, complements of his 20-plus years at Intel, did not translate into networking savvy. Though he won kudos from Wall Street for dressing up Bay for sale, his lack of

understanding of network technology was evident in the keynote addresses he delivered at major industry trade shows. The speeches were generally light on technical detail and insight, observers say.

"He comes from a background in chips and computing, and whether he can run or make a transition to a large network company is a relevant question to ask," says Michael Speyer, an analyst at The Yankee Group in Boston.

House denies that he was overwhelmed by the technical aspects of the network



Former Bay leader House resigns from Nortel post.

industry.

"From a technology standpoint, clearly Nortel is the industry leader in Layer 3 switching, in gigabit networking, in VPNs and in WAN access," he says. "It must have been a competitor you were talking to."

## Just moving on

House says it is time to go now that Nortel and Bay have been integrated.

"Basically, I had worked myself out of a job," House says, stealing a quote from his boss Roth. "The merger job is done and I notice my workload falling off. I think it's a good time to transition."

House also denies that his position at Nortel was transitional.

"We did the merger with the idea that I would be in that position on an indefinite basis," he says.

Roth says House's position was more than temporary because he helped orchestrate

the massive merger of Nortel and Bay. House also helped define how Bay's IP and data network technology would fit into all of Nortel's assets; and he brought a faster, Internet pace to the slow-moving telecom giant.

House's plans for the future are to get some rest, unpack some of the boxes in his new home, spend time with his children and grandchildren, and play some golf. He may also dabble in venture capital funding of Silicon Valley start-ups.

"At this point in my life I've had enough success that I don't need to work unless I want to," he says. "Whatever I do will be exciting and challenging because I won't do it if it's not fun."

Separately, Nortel announced that Bill Hawe has been appointed chief technology officer for the company. Hawe had been vice president of architecture for Bay. ■

# Akamai to speed up the Web, or your money back

BY ROBIN SCHREIER HOHMAN

CAMBRIDGE, MASS. — Web-hoster Akamai Technologies recently made its formal launch with a splash of high-profile customers, gobs of funding and a cocky guarantee that it will always deliver content faster than the regular old Web.

Akamai also promises 100% uptime for every page that it hosts, or your money back.

Akamai offers a combination server load-balancing, transparent caching and Web-hosting service all in one.

The Cambridge, Mass., start-up says its 600 servers in ISPs around the globe can push Web content to users measurably faster and more reliably than a content provider could alone. The company has the ability to crank out 11G bits worth of data every second. Its servers are currently putting out 500M bit/sec, or about 5% of capacity, says David Good-

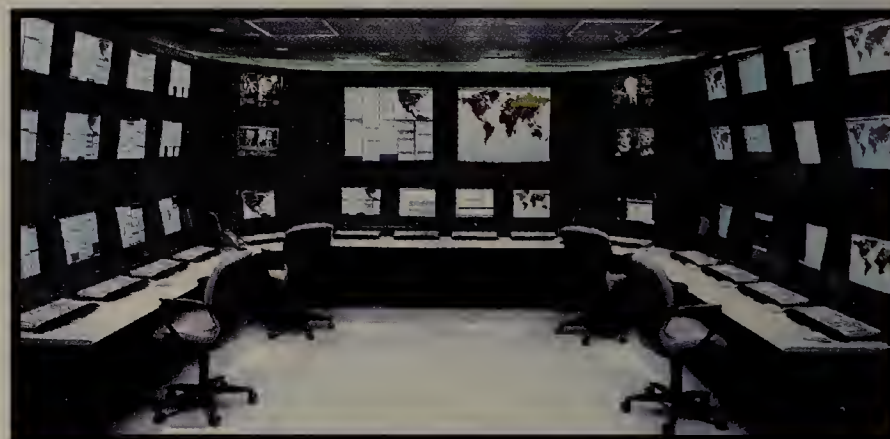
tree, a vice president at the company.

The service relies on Akamai's FreeFlow software, which does multi-network load management in real time, Goodtree says.

Akamai opened its doors on April 1, and says it hasn't experienced a glitch since. To prove its mettle, Akamai came out of the gate flashing customer names of such Internet notables as Yahoo, CNN, About.com (formerly The Mining Co.) and Go Network.

Akamai doesn't host all the content from these Web sites, however. The company is concentrating on hosting the bandwidth-intensive graphics. On the Yahoo site, for example, Akamai hosts the bold red Yahoo graphic, not the entire site.

In Yahoo's case, the Yahoo Webmaster uses an Akamai utility, FreeFlow Launcher, to



Akamai monitors the content delivery of about 20 Web sites, including CNN, the Go Network, About.com and Yahoo, at its network operating center in Cambridge, Mass.

earmark the graphic. Yahoo still takes the initial hit by the browser, but the request for the pipe-hogging graphic is shuttled off to the Akamai server, where a copy of the graphic resides.

As Akamai receives more hits, it will add more copies of the graphic to keep performance high.

If your Web site doesn't run faster and stay up 100% of the time, Akamai will refund its fees for that day.

Akamai also announced last week an additional \$35 million in venture capital, for a total of \$43 million since its inception

in September 1998. Its backers include Battery Ventures, Polaris Venture Partners and Baker Communications.

The company also has heavy-hitters on its informal board of advisors, including Internet guru Tim Berners-Lee and Pete Solvik, the chief information officer of Cisco.

Paul Sagan, Akamai's president and chief operating officer, was president of Time, Inc. New Media. Akamai's chairman and CEO is George Conrades, formerly president of BBN, which was sold to GTE and became GTE Internetworking. ■



As featured in the NW200 Issue, April 26, 1999.





## The Scoop

The news behind the news

### APPLICATION MANAGEMENT APIs

**T**he good news is that some powerful application management techniques are becoming available. The bad news is they require systems managers to get down and dirty with application code. Even worse, support for management tools is sparse.

Using application programming interfaces, such as Application Response Measurement (ARM) and Application Management Interface (AMI), systems managers can collect data about what's happening with their key software. The advantage of using these APIs is that the information comes directly from the horse's mouth — that is, the applications themselves.

ARM provides a way to measure the response time of an application, while AMI can output the value or state of any application variable.

One problem with ARM and AMI is that vendor support for them remains limited, analysts say. ARM is supported by Hewlett-Packard, Tivoli and precious few other management software vendors. AMI was submitted to The Open Group in April but is currently supported only by its sponsor, Computer Associates.

"The dream that systems management vendors had as they moved into application management was that there would be a nice, standard way to do it," says Matthew Nordan, computing analyst at Forrester Research.

These vendors looked at the success of standards such as SNMP and wanted to repeat that success with applications. With SNMP, data is fed directly from network devices to management tools. The idea with ARM was to feed data directly from applications to those tools, Nordan says. Then the systems management software could chart the data.

But users haven't put pressure on vendors for ARM support, nor have users ARMed many of their applications. Part of the reason is that it requires some effort to rework applications and insert calls to ARM APIs.

Some vendors have built management tools to do the

same types of functions that ARM does, without requiring users to change their code. One such vendor is FirstSense, whose software looks at screen cues to determine what function a user is performing. By observing the information flashing across a screen, the software can tell when transactions are starting or stopping and measure transaction performance.

FirstSense has no plans to support ARM because users aren't asking for it, says Robert Cramer, vice president of marketing and business development for the company. "The day we get any kind of customer-driven demand, we'll do it," he says.

Analysts say that ARM has technical merit but still lacks industry momentum. "Unfortunately, in this industry, technical excellence doesn't ensure commercial success," says Rick Sturm, principal of Enterprise Management Associates.

Today, most of the industry's emphasis is being placed on getting the Common Information Model (CIM) to work, he says. CIM is a standard way to exchange data among management applications.

AMI was brought to The Open Group by CA and J.P. Morgan. CA built the AMI to watch J.P. Morgan's applications closely, and CA's Unicenter systems management software can look for AMI data, says Sam Greenblatt, senior vice president of advanced technology at CA. But the financial services company wanted to make AMI a standard to ensure that any other applications it acquires in the future can use the same data, he says.

Using AMI, an application can output the dollar value of its transactions and tally up other statistics around those transactions. Greenblatt sees AMI as a superset of ARM, which focuses on response time. If AMI continues on The Open Group's fast track for standardization, it could be a standard by the fourth quarter of this year.

— Jeff Caruso



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Here are this week's questions. Enjoy.

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3. Favorite dish that you cook.
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5. Most memorable event in your life.

this just in: the gold medal goes to Compaq Tru64 UNIX on Alpha Server DS20 which runs Java apps 62% faster than Sun Solaris

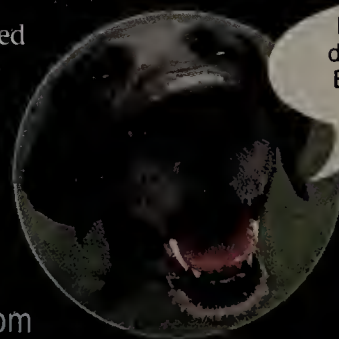


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# Worm outbreak has managers fishing for answers

*ExploreZip could have been worse, experts agree; rapid response to quash destructive viruses is key to avoiding loss of data.*

BY PAUL  
MCNAMARA

Now that the ExploreZip "worm" has been plucked from most networks, post-mortem discussions of the episode have IT managers marveling that the damage wasn't worse and plotting new strategies for warding off future infestations.

"This had the potential to be disastrous," says Bill Veigele, director of computing services at StorageTek in Louisville, Colo., where the worm caused major disruptions but little irreparable harm.

While the earlier Melissa virus hit more companies and more end users, ExploreZip was clearly more dangerous. ExploreZip, which crawled its way into corporate nets via e-mail, deleted data from files on both personal and shared drives, with the latter occurring automatically once a single desktop on a LAN became infected.

"It's this automatic worm-like propagation that explains why the program was spreading so rapidly," says Mark

Zajicek, a member of the technical staff at Carnegie Mellon's Computer Emergency Response Team (CERT). "Once it gets on one machine inside a network, it can quickly infect dozens or hundreds of other machines."

That's exactly what hap-

One expert suggests that "rapidity of response" to these attacks has become ever more crucial as the viruses continue to become more sophisticated and destructive.

"What we're recommending to our clients is to make sure that they've got some service-level agreement with their antivirus provider, so in a certain period of time they'll be guaranteed to get the updated [virus] signatures," says Bruce Murphy, head of Pricewaterhouse-Cooper's security risk management group.

Murphy also advises having backup methods in place for acquiring those virus signatures, or identifiers. He says these plans should include "a sneaker-net mechanism or putting someone on a plane," given that delivery over the Internet can be difficult or impossible when a major outbreak occurs and everyone wants service at the same time.

Network executives say they are taking a number of steps to ensure that their organizations are better prepared for the next infectious episode.

"Until Melissa and [ExploreZip], e-mail server antivirus protection was something we were looking into in our spare

time," says Todd Inch, communications manager at Cottelligent in Bellevue, Wash. "I've never seen anything as serious and tangible as these last two, however, so we've increased the priority a bit, actually installing [the software] we'd already bought for testing."

At StorageTek, the battle with ExploreZip has prompted the company to update its written emergency response policy.

"We had a chapter for snowstorms, for fires, even for terrorism, but we didn't have one for viruses. We're going to be adding that chapter now," Veigele says.

Like many companies, Dow Chemical has been working with its antivirus vendor to get help faster once a threat is identified.

However, Dow is also looking inward, according to Clay Harper, the company's workstation product manager.

"We are taking some internal steps to be sure we have better response to alerts that we receive during off-hours, especially on weekends," Harper says. "We're looking to use the parts of the organization that operate around the clock to sound the alarm in the event of a virus alert."

This heightened sense of awareness in IT departments bodes well for future battles against these e-mail-borne viruses, according to CERT's Zajicek, but being prepared will not necessarily win the war.

"It is encouraging, but at the same time the machines, the computer systems and the programs that we run on them are all becoming more and more complex," he says. "Therefore, there are more potential vulnerabilities that may be out there waiting to be uncovered." ▣


## Online antivirus resources

Those still looking for help in dealing with ExploreZip might try the following:

- CERT Coordination Center, Carnegie-Mellon Software Engineering Institute: [www.cert.org](http://www.cert.org)
- International Computer Security Association: [www.isca.net](http://www.isca.net)
- Virus Bulletin: [www.virusbtn.com](http://www.virusbtn.com)
- Wildlist Organization: [www.wildlist.org](http://www.wildlist.org)
- Usenet: [comp.virus](mailto:comp.virus) (moderated); [alt.comp.virus](mailto:alt.comp.virus) (unmoderated)
- VIRUS-L, a moderated mailing list. To be added, send e-mail to [listserv@lehigh.edu](mailto:listserv@lehigh.edu), with only "SUB VISUS-L (your name)" in the message body.

pened at StorageTek, where 30,000 instances of the worm infected 3,100 of the company's 4,000 local desktops.

About 100,000 files containing 600G bytes worth of data were deleted, according to Veigele. The data was restored using Central Archive Manager, a network backup product that StorageTek makes.



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**This week's question:**

What's the name of the Gigabit network technology invented by Roger Billings during the early 1990s?

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and the winner in the category of customer satisfaction by a UNIX (the envelope please) is Tru64 UNIX by Compaq

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# Qwest's grip slips on US WEST, Frontier

Broadband carrier faces big selling job to win bidding war against Global Crossing.

BY DAVID ROHDE

NEW YORK — Even for hyperkinetic Qwest CEO Joe Nacchio, there may not be enough hours in the day to convince investors that Qwest's bid to purchase US WEST is a good idea.

The broadband long-distance carrier last week bid \$55 billion for regional Bell operating company US WEST plus Frontier Communications, a combination local and long-distance carrier with roots in the Northeast. US WEST and Frontier were already linked because they have received purchase offers from Global Crossing, an international carrier that lacks the domestic presence Qwest already has.

But Qwest's stock lost more than 20% of its value on the day the bid was announced, as growth-stock investors turned up their noses at Qwest taking on an RBOC burdened with seemingly endless quarrels with state and federal regulators over service problems.

Nacchio promptly began a tour of leading institutional investors, trying to convince them that the combined companies would constitute a growth stock well worth keeping. But that claim left users and technology analysts raising their hands, asking how they could benefit from a deal in

which the RBOC is still not authorized to sell long-distance services and has few prospects of getting into the business anytime soon.

Even Qwest executives admitted that they built into their merger model an assumption

week rushed out a report calling the Qwest/US WEST combination a "merger mistake." Partly because of regulatory restrictions, Mines says. "There's no new service or accelerated innovation or really customer-focused thing that is brought to

ioned telco woes.

For example, following rampant service problems over the past few years, state regulators and consumer advocates in many of US WEST's states have formed a regional council to hold the RBOC accountable for

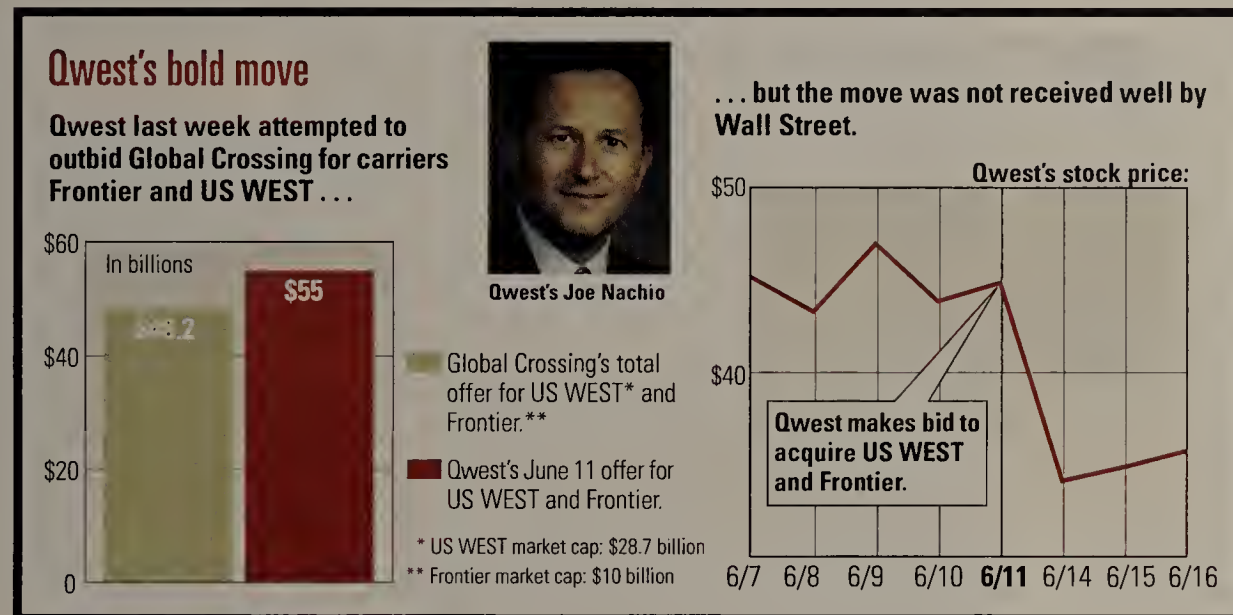
distance business is largely controlled by the FCC, which wants to see residential telephone competition before unshackling the Bells.

But Nacchio says the deal brings many new assets to Qwest that it wouldn't have otherwise. In a meeting with investment analysts, he lauded US WEST as the RBOC with the biggest deployment of digital subscriber lines (DSL). He also noted US WEST has a division that sells frame relay and other data services out of its region. He noted that Qwest has signed deals with new DSL carriers but hasn't deployed any such local loops yet, compared to US WEST's 35,000 local loops.

Nacchio also indicated that the real sleeper in the deal could be Frontier. The company's GlobalCenter unit is one of the nation's leading Web-hosting companies. And GlobalCenter's 11 super-points of presence for hosting Web sites with direct broadband access into the Internet backbone would dramatically boost Qwest's seven POPs, including CyberCenters. "It's very substantial competitive force, I believe, to UUNET when this gets done," he said.

But even in today's merger-mad market, some experts wonder whether a few gems, such as DSL and Web-hosting sites, are worth having with all the other "baggage" that legacy carriers bring — especially at the price Qwest seems willing to pay. "GlobalCenter is a good hosting company, but the question is what else do you get?"

See **Qwest**, page 92



tion that US WEST would not win long-distance authority from the Federal Communications Commission until Jan. 1, 2002, meaning opportunities to sell end-to-end services would have to be shelved until at least then.

Qwest and US WEST are like "oil and water," says Christopher Mines, an analyst with Forrester Research in Cambridge, Mass. Forrester last

the market any quicker as a result of this combination."

Jonathan Haller, director of network and Internet services at Current Analysis in Sterling, Va., fretted that fleet-of-foot Qwest — which is nearly finished building its 18,000-mile national network and has signed up enterprise customers much faster than other highly hyped new carriers — could get bogged down in old-fash-

everything from installation intervals to universal service. "Is Qwest adept at fighting the regulatory game? That's not its competency," Haller says.

Qwest has also had private merger talks with BellSouth, but in both cases, many of the specific market plans depend on the RBOC winning long-distance authority (NW, June 14, page 70). The schedule for RBOCs getting into the long-

the race to map the human genome is projected to end two years earlier thanks to team Compaq Tru64 UNIX and Alpha Servers



## THE MICROSOFT REPORT

The fruit of the labor that Microsoft and beta testers have put in on Windows 2000 Beta 3 is ready to be picked from the tree, Microsoft executives said last week. As early as next week, and no later than the first full week of July, the company will ship Windows 2000 Release Candidate 1.0, according to Jim Allchin, executive vice president of Microsoft's Business Enterprise Division.

The release candidate incorporates feedback from Beta 3 testers. Allchin says there will be another release candidate shipped six to eight weeks after the first one, but that he "feels good about where we are with Beta 3."

There have been a few bugs in the Beta 3 fruit, however, including reports from customers who have had difficulty getting the operating system installed. There also have been issues about configuring the system once it is installed, Allchin says.

With the feature set locked down, the Windows 2000 development team is madly picking those bugs out before delivering Release Candidate 1.0.

Allchin says Microsoft will not ship Windows 2000 until it is more reliable than NT 4.0 "with the most current service pack, which at that time will probably be Service Pack 6. I will guarantee that Windows 2000 will be significantly better than what customers have now," he says.

If it's not, he may get pelted with rotten fruit hurled by many of the company's nearly 500,000 beta testers.

Of course, Allchin left himself an out. He says final code won't ship until customers tell Microsoft it is ready. So if things go haywire, who's to blame?

### Speaking of getting it right

To increase the manageability and scalability of applications designed for Windows 2000, Microsoft last week released an Applications Specification for the platform. Application vendors that bow to the specification get the coveted Windows 2000 logo for their product boxes. The specification covers desktop and server-based applications, with one of the biggest requirements being a self-repairing installation that reduces the "DLL-Hell" that has forced more than one administrator

over the edge. The specification is posted at [msdn.microsoft.com/winlogo/appspect.asp](http://msdn.microsoft.com/winlogo/appspect.asp).

### A marriage made in database heaven

Microsoft's Access software finally has the kind of back end that would make any self-respecting database administrator proud. Last week, Microsoft unveiled Access Projects, a new feature for Access 2000 that lets users create a database application with Access on the front end and a native connection via OLE DB to SQL Server on the back end. In addition, a new Access Upsizing Tool automatically recreates an Access database on SQL Server. Microsoft stopped short of putting a dinosaur logo on Access — but it's clear that as a database engine, Access' days are numbered.

### All breadbuds on deck

Microsoft has been on a tear recently in the broadband market, most notably with a \$5 billion deal with AT&T and the purchase of or investment in several British cable companies. Microsoft is using the shotgun approach to make a play in an industry that will supply big pipes to consumers and businesses. "We don't favor one flavor of broadband, it's all just a general interest in the potential of broadband," says Bob Herbold, chief operating officer for Microsoft. "We believe in the dream." Gentlemen, start your steamrollers.

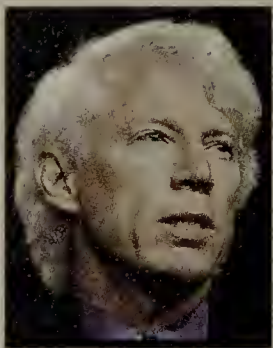
### All right, already

Microsoft officials can't stop talking about a recent reorganization that has divided the company into units representing enterprise customers and consumers. Lead-ins to every discussion during a day

of press briefings last week in Redmond, Wash., were loaded with giddy talk about the "reorg." Microsoft believes its new internal structure is key for the company going forward.

Yeah, not to mention the need for the successful launch of a certain operating system and a little litigation luck against the government meanies.

— John Fontana



Microsoft's Allchin won't give Windows 2000 a date.



The box is done. Now all we need is some finished code.

## Microsoft helps lessen risk of moving to Active Directory

Licenses tool to smooth conversion from domains.

BY JOHN FONTANA

REDMOND, WASH. — Microsoft last week finally strung a safety net for those feeling uneasy about walking the tightrope between NT domains and Active Directory.

What NT 4.0 users face in moving to Windows 2000 is the perilous no-going-back task of converting and consolidating domains into Microsoft's new distributed directory service — in a production setting. The fear is that if the Active Directory implementation fails, critical user and group information, permissions and Exchange mailboxes would be lost.

To address this fear, Microsoft has licensed technology from third-party developer Mission Critical Software that gives network administrators a chance to model and test Active Directory implementations before putting them into production.

The tool, which will ship with Windows 2000, also provides users with the ability to run NT 4.0 domains and Active Directory at the same time and roll back to previous configurations in the event something goes wrong.

Getting from domains to Active Directory has been a big focus for Frank Asenjo, lead systems engineer for the national accounts division at Automatic Data Processing. "We have modeled four scenarios and ported them to a test system," says Asenjo, who is using the full Mission Critical suite. "But for Microsoft to include this functionality with the operating system is a feather in its cap."

"It's clear what Microsoft is hearing from its rapid deployment program is that migration issues are significant, and Microsoft is addressing that," says

Jamie Lewis, president of The Burton Group. "Without good migration tools, Microsoft will discover what Novell did with NDS — that the brute force method just doesn't work."

Active Directory still lacks a number of features, including two-way data synchronization with Novell Directory Services. Microsoft also has yet to develop a metadirectory strategy for integrating Active Directory with other directories.

Microsoft is licensing Mission Critical's Domain Migrator

### Active Directory helper

Microsoft last week licensed a directory migration tool from Mission Critical Software in order to ease the move from NT 4.0 to Active Directory.

Here is a sampling of the tool's features:

Feature	What it does
<b>Task-based interface</b>	Walks users through logical steps for upgrading domains
<b>Modeling</b>	Allows users to create, populate and run test directories
<b>Rollback</b>	Provides return to previous configurations in event of error
<b>Reporting</b>	Gauges impact of models and assesses live changes
<b>Parallel Domain Support</b>	Keeps NT domains active until Active Directory is stable

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tool, which is part of Mission Critical's OnePoint suite of directory management tools. The tool includes support for simultaneously deploying individual domains in NT and Active Directory. This "cloning" feature means data can exist in both places at the same time. If the Active Directory deployment fails, the system can cut over to the NT domains.

Mission Critical is not the only company addressing the problem. Fast Lane Technologies has DM Manager, which is similar to Mission Critical's software.

Microsoft will include Domain Migrator with Windows 2000, although the company has yet to decide if Domain Migrator will be built into the software or included on a CD. ■



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**Java,**  
continued from page 1

from 14,000 a year ago. According to Sun, there are now 1.7 million programmers using Java, which just celebrated its fourth birthday.

You can find a bunch of those programmers at Instinet, which this fall plans to launch an electronic brokerage system for the fixed-income securities market, where government bonds and the like are traded. Instinet selected Java for the middle and end-user tiers of this application.

The company chose Java because Instinet's system had to be object-oriented, developed quickly and able to handle what's expected to be 1,000 transactions per second at the outset, says Duncan Johnston-Watt, head of development for the Instinet Fixed Income system.

Java and a set of supporting products, particularly Persistence Software's PowerTier application server, have made it possible for Instinet to meet these goals for a very complex, high-volume transaction system. "A year ago, this was all nothing more than paper," Johnston-Watt says. "The beta starts in July, and we'll launch the service in early fall."

## Why Java?

For DHL Worldwide Express, the move to Java evolved from a tactical decision to experiment with the technology to fix an aggravating problem: It was taking too long for customer service representatives to obtain faxed copies of customers' original airbills from a remote DHL database.

After writing some Java server code and loading it on an application server, the service representatives could see a digital image of the airbill, says Oliver Deschryver, DHL's director of Web architecture. In just weeks, these "lookups" jumped from 500 to 20,000 per month. DHL has linked this application to other existing systems to move custom documents and

approvals faster, as freight is in transit.

"Every new application at DHL is pushed toward being written in Java, unless there is a compelling reason not to," Deschryver says.

The Home Depot chain is

Schneider National, the biggest full-load trucker in North America, is using IBM's VisualAge for Java to write a new order-capture system, to let the company's staff instantly access the most up-to-date data from all sources needed to make shipping order decisions.

to architect our software to run on any hardware and software architecture," says Murali Chirala, president and co-founder of CyberBills, in Santa Clara, Calif. "With the Java byte code, we get operating system independence."



While JavaOne attendees saw the sights and sounds, the enterprise customers among them plotted their next application moves.

relying on Java to create new services for its customers, says Mike Anderson, vice president of information services.

The company has devised an application platform based on Java, the Common Object Request Broker Architecture and the Lightweight Directory Access Protocol. The company has taken just four

The trucker is running Java code on IBM's WebSphere application server, which sits on Schneider's S/390 mainframe, says Steven Matheys, vice president of support services for IT.

Matheys says the Java system will be challenged to handle all the company will throw at it. He projects the

CyberBills was formed last year to build a software system that lets consumers view, manage and pay all their bills via the Web.

While Java is still growing up, Chirala acknowledges, "It's sufficiently mature for me to bet my company on it."

## Portability advantage cited

Charles Schwab & Co., the big discount brokerage, chose Java initially as part of the company's shift from mainframes to a tiered computing approach. Being able to write reusable business services that would run unchanged on a range of computers is very important to Schwab, says Lisa Villareal, senior vice president for data and application services.

"We're in a very mature industry," she says. "We have to be able to change quickly. We're using Java at every application tier. ■"

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## "The Java platform is now the mainstay for the enterprise"

Alan Baratz, head of Java software group, Sun

months to build the first application based on that platform: a point-of-sale system for renting tools from Home Depot stores.

"We're excited about the ability to create an application foundation that we can run across all operating systems," Anderson says.

new order system will have to handle from 2,500 to 5,000 concurrent taps on the "ENTER" button. Software vendors will need to work hard to ensure that their Java programs can handle such loads, he says.

Start-ups are adopting Java as well, and here Java's portable code is a big attraction. "We had

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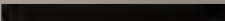
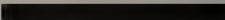
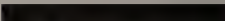
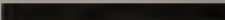
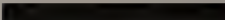
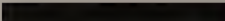
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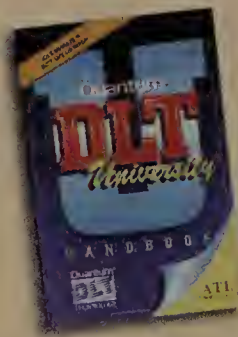
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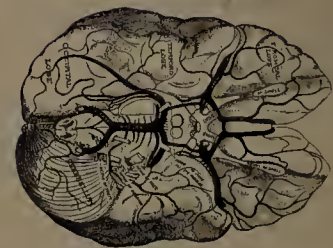


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## Briefs

Hewlett-Packard has unveiled a low-end Fast Ethernet switch that lists for \$50 per port. The ProCurve Switch 408 has eight 10/100M bit/sec Ethernet ports that can automatically sense whether the network segment at the port is running Ethernet or Fast Ethernet. The ProCurve 408 is shipping now for a list price of \$400.

HP: (800) 752-0900

Novatel Wireless has introduced a modem for laptops and Windows CE-based handheld computers that provides the devices with wireless e-mail, Web access and corporate network



Novatel's new wireless modem weighs less than 2 ounces.

access. The Merlin Type II Wireless IP Modem runs at 19.2K bit/sec and fits into a Type II PCMCIA card slot.

The modem, which weighs about 1.6 ounces, has a foldable antenna. The product will cost \$280 when it ships in August.

Novatel: (888) 888-9231

Memotec Communications and Milgo Solutions (formerly Racal-Datcom) have formed an alliance to co-market their respective voice, data and video communications products.

The agreement covers Memotec's CX series of ATM, frame relay, IP and ISDN access devices, as well as Milgo's digital service units, modems, multiplexers and communications servers. Financial terms of the agreement were not disclosed.

## Care of NT nets made less expensive

BY JOHN FONTANA

It doesn't take Comdex to prove that people like free stuff.

But try staffing an administrative workstation with a bag full of free T-shirts, and your freebies' value is quickly apparent.

What has a greater return is plugging in no-cost or low-cost tools that will help network administrators better understand what is happening across their Windows NT infrastructures.

There is no doubt that a costly package of know-how from a well-known vendor can make any network perform better, but network administrators also have access to a host of tools that don't cost a thing.

Of course, in most cases the user gives up a well-oiled support and services infrastructure. Then again, these utilities aren't likely to be the backbone of an enterprise tool kit.

With these things in mind, we queried some of the Windows NT faithful and did a little leg work to come up with a handful of tools that are finding popularity across enterprise networks.

### Utility heaven

A number of Web sites provide a clearinghouse for Windows NT utilities. As with anything downloaded from the Internet, network administrators should take the appropriate precautions.

Site	URL
WUGNET	<a href="http://www.wugnet.com/shareware/ntmap.html">www.wugnet.com/shareware/ntmap.html</a>
SystemTools	<a href="http://www.systemtools.com/cgi-bin/redirect.pl?free.htm">www.systemtools.com/cgi-bin/redirect.pl?free.htm</a>
BHS	<a href="http://www.bhs.com">www.bhs.com</a>
Smartline	<a href="http://www.protect-me.com/soft">www.protect-me.com/soft</a>
AppFinder	<a href="http://www.appfinder.com">www.appfinder.com</a>
Microsoft	<a href="http://www.microsoft.com/ntserver/nts/exec/vendors/freeshare/maintnce.asp">www.microsoft.com/ntserver/nts/exec/vendors/freeshare/maintnce.asp</a>



These utilities can help troubleshoot and manage your Windows NT nets.

### Filemon and Regmon

These tools are freeware when used on a single machine, but the enterprise versions (\$99, including five-user licenses) can be used across a network.

Filemon monitors and displays all file system activity through a graphical user interface. It can show how applications use files and Dynamic Link Libraries, or track problems in system or application configurations.

Regmon keeps an eye on the

Windows Registry and displays real-time data on a systemwide basis each time the Registry is accessed. The tool helps track errors caused by misconfigured Registry settings.

"Filemon and Regmon are musts," says Jeff Goldner, team leader for platform software at Pathlight Technology. "Both are essential for locating why permissions don't work."

[www.sysinternals.com](http://www.sysinternals.com)

See **Tools**, page 24

## IBM crashes eight-way server party

*Company offers new clustering and switching technologies.*

BY MARC SONGINI

There is no shortage of eight-way PC servers coming to the market, so IBM is determined to stand out by adding a few special touches.

IBM executives are promising new clustering, management, storage and switching technologies — all to push its new Netfinity 8500R to the head of the pack. IBM also says the box fits into the company's so called X-architecture strategy, which helps migrate top-of-the-line server technologies, such as mainframe-level high-volume bandwidth I/O, down to Intel-based PC servers. For instance, the 8500R is compatible with IBM's SP switch, which previously only worked with RS/6000 machines.

The 8500R will carry up to eight 550-MHz Intel Pentium III Xeon chips and contains 12 hot-swappable PCI slots. The device will have 16G bytes of

memory and will start with about 100G bytes of storage, IBM says. The server also comes with a management chip on its motherboard that monitors the system's health, including the status of the power supply and disks. Integrated with Netfinity Manager software, the management chip can automatically detect a problem and contact IS staff remotely, says Jim Gargan, an IBM executive.

Among the new options being announced with the 8500R are:

- The Netfinity SP switch, which will allow users to combine up to 14 servers into one high-speed clustered system.



IBM's Netfinity 8500R is among the best eight-way Xeon offerings.

The switch will run at 2.5G bit/sec full-duplex and will work with any Netfinity two-, four- or eight-way box.

- A new RAID card, which will allow users to utilize otherwise unavailable storage disks, boosting performance by 25%.

- IBM's Cornhusker clustering software, which will allow users to tie up to eight servers together and allow the machines to do load balancing. Currently, users are limited to just two servers in a cluster.

IBM's add-ons rank the 8500R among the best eight-way Xeon offerings, on par with products from market leader Compaq, says James Gruener, an analyst with Aberdeen Group, a

Boston consultancy. "It really does carve out new high ground for Intel architecture servers," he says.

The 8500R will be available by the end of the third quarter and pricing will start at around \$20,000.

IBM: (800) 426-4968





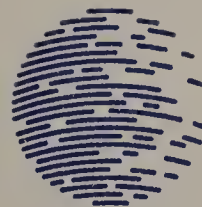
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# Home video firm calls it quits, but its network may live on

BY PHIL HOCHMUTH

**D**igital Video Express sought to build a high-availability, transaction-based network to achieve a specific goal: To ensure you never had to return a rented movie to the video store again.

Unfortunately, it looks as though that network will never get a chance to shine. That's because Digital Video Express, known as Divx (the same name as its technology), last week called it quits.

But don't necessarily blame the underlying network. Divx attributed its demise to a lack of retailer and movie studio support.

The company, which introduced its technology in October, will continue to serve existing customers for two more years.

Divx movies come on discs that are played on special DVD players labeled as having "Divx enhancement." However, instead of buying expensive DVD discs, which can cost more than \$20, or renting discs for a limited time, you can purchase Divx movies for around \$5.

Once bought, the disk can be watched free of charge for a 48-hour period, starting when the movie is first played.

If the movie is viewed again after the free period, it is, in a sense, rented at a cost of \$3.25. Data on additional viewings is recorded in the player's memory and is sent via an onboard modem over a phone line to Divx's billing system in Richmond, Va., on a twice-monthly basis.

"The calls are toll-free, and they're made a couple times a month in the middle of the night, so as not to be obtrusive to the customer," says Andy

Schwarz, director of production services for Divx. The calls are encrypted using a proprietary method, he says.

Data from the players is sent over public phone lines via X.25, a transaction protocol commonly used for credit card verifications and automa-

the lines also have load-balancing and failover capabilities.

Incoming calls enter Divx's Richmond facility via Kentrox DSU/CSUs and Cisco 7500 routers.

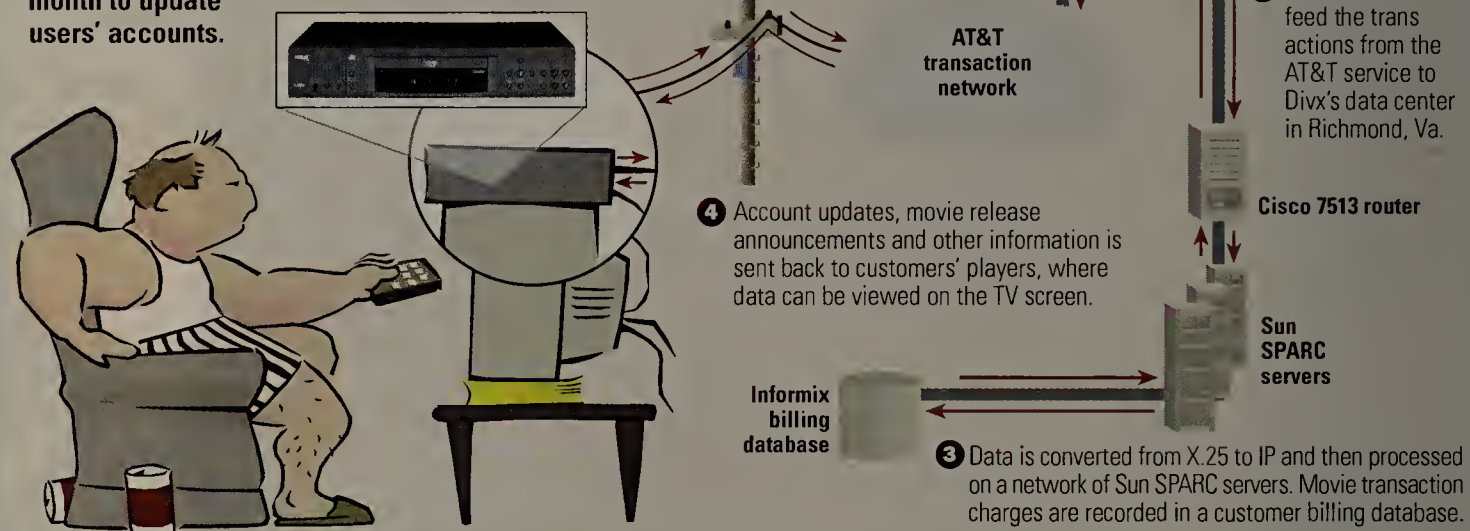
On the back end, transactions are processed by a network of Sun SPARC servers running DCE/Encina middle-

network, letting customers view account updates and other information right on their televisions.

With calls being received twice per month from the 100,000-plus households with Divx players, downtime is not an option. In

## Remote movie rental

Divx-enabled DVD players call a back-end billing system twice per month to update users' accounts.



ed teller machine transactions. The calls are routed via an AT&T offering called Transaction Access Service (TAS), according to Diane Schnupp, manager of telecommunications for Divx.

"When a player dials in to Divx, the call traverses the AT&T 800 network to reach the TAS network, which provides a managed modem service," Schnupp says. "The circuits enter our facility on multiple redundant T-1s that are built on a fiber ring," she says, adding that

ware on the Solaris operating system. These servers run Divx's proprietary front-end processing software, which does protocol conversion from X.25 to IP and routes transactions to the billing system.

The billing system, which is based on another set of SPARC servers running Solaris, processes and records transactions on an Informix database. Once processed, account data is downloaded back to individual players via the AT&T

designing the network, Jack Cox, manager of transaction technologies at Divx, says he favored availability and scalability over speed.

"We're a 24-7 business that is very transaction-oriented," Cox says.

Although it appears that Divx (the company) will be short-lived, Divx (the network and technology) could still prove to be a model for future transaction-oriented systems. ■

## Legato continues on acquisition spree

Company spends \$94 million on Vinca, maker of data mirroring software.

BY DENI CONNOR

**PALO ALTO** — Legato Systems has established a name for itself in the storage management market over the past 10 years with home-grown products, such as those in its NetWorker line. But in an attempt to deliver a much broader set of server-

and storage-related products, the company has increasingly been turning to acquisitions.

Most recently, Legato announced plans to snap up Vinca, a company best known for its NetWare server clustering software.

Vinca, which also offers software for NT and OS/2 servers, agreed to be bought

for \$94 million.

The deal marked Legato's fourth buy in the past 12 months. According to Legato officials, acquisitions are the fastest way for the company to get into increasingly hot markets, such as the data protection and server availability markets.

Earlier this year, Legato gob-

bled up Fulltime Software, a maker of clustering and data replication software for NT and Unix networks, and Intelliguard Software, which makes serverless backup tools. Last July, Legato acquired Software Moguls, a vendor of backup and restoral software for NT and Unix machines.

With the acquisition of Vinca, Legato gains the well-regarded StandbyServer line of server mirroring products.

Vinca's software mirrors data from a primary server to a backup server, so if the pri-

mary server fails, the backup server can take over its duties.

Vinca also sells software that lets two servers back up each other. Another Vinca package, SnapShotServer for NetWare, is an online backup and recovery system.

"This acquisition allows Legato to become a full-service storage management supplier in the mirroring and data availability area," says Dave Hill, an analyst at Aberdeen Group in Boston.

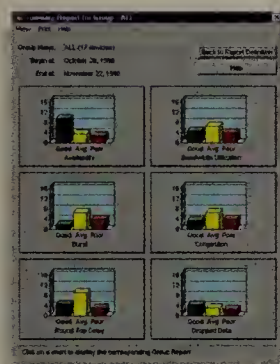
Legato posted revenue of \$143 million and earnings of about \$28 million in 1998. ■



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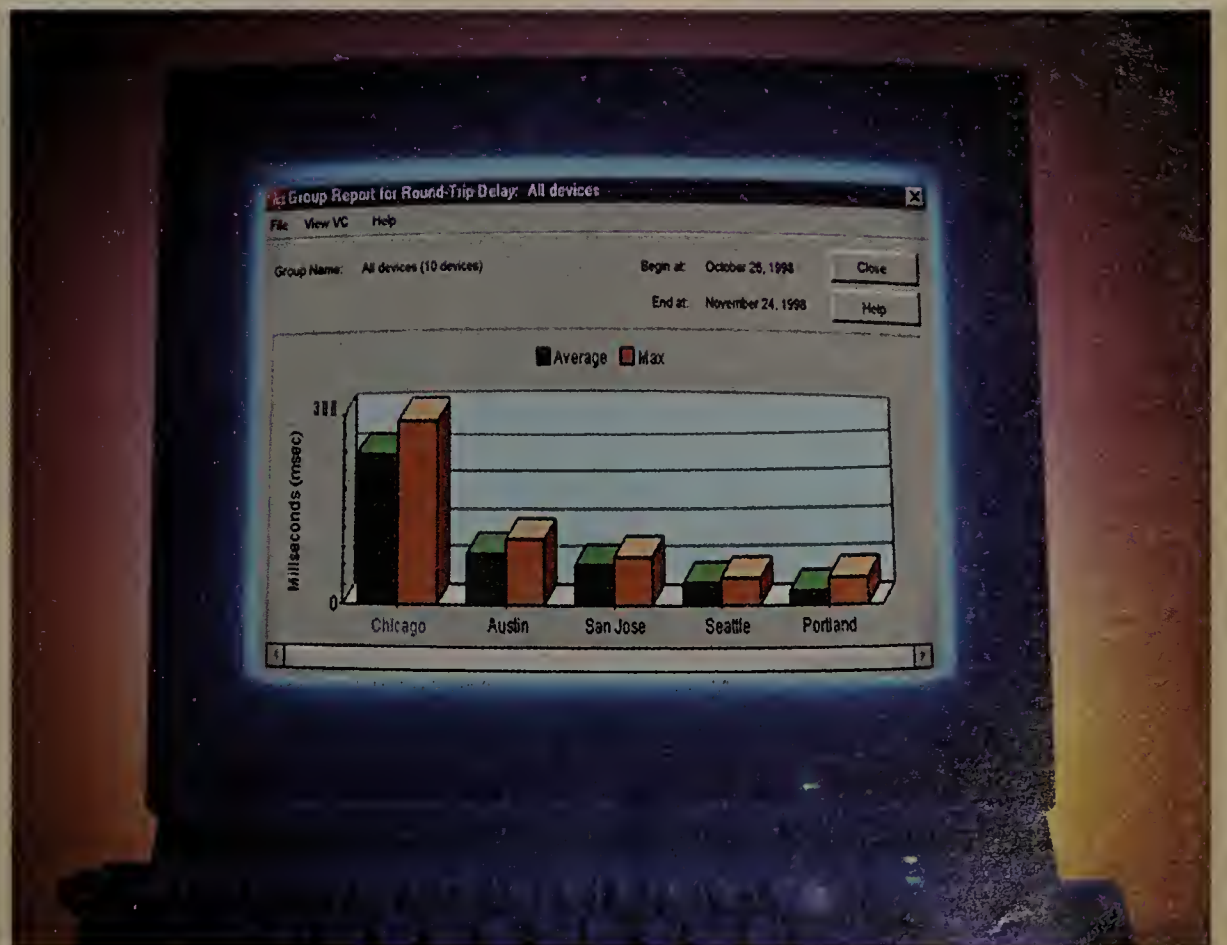


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# What You Should Know About Your Frame Relay SLA Performance.

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**Tools,**  
continued from page 19

## VNC

Virtual Network Computing (VNC) is a remote control freeware utility that was developed in AT&T

Laboratories, Cambridge, England, by researchers who wanted to view Unix environments from their PCs. VNC distinguishes itself from other remote display packages because no "state" is stored on its viewer. That means a user can remotely

access his desktop and find it exactly the way it was left, even with the cursor in the same spot. The Windows NT version allows you to look at an NT desktop from any platform, including Linux.

[www.uk.research.att.com/vnc](http://www.uk.research.att.com/vnc)

## Exporter and Machines

Several users reported an affinity for Hyena, a management and administration tool that costs about \$200 per administrator. But a couple of utilities associated with Hyena are available for free. Exporter is a command-line tool that exports information about users, groups, group members, computers, services and printers to a tab-delimited text file for all server or workstations in any domain. The text file can then be loaded in a spreadsheet or database for evaluation.

Machines is a simple program that reports the number of days that have elapsed since an NT computer has re-established its password with the domain controller for a domain. It can be used to determine accounts that are no longer being used.

[www.systemtools.com/cgi-bin/redirect.pl?free.htm](http://www.systemtools.com/cgi-bin/redirect.pl?free.htm)

## FREEping

"We use FREEping to monitor which servers are up or down, or if there are routing issues," says Taed Nelson, network engineer for Vertical Networks. FREEping will flash a pop-up window when a server goes down. Users can set fixed intervals for FREEping to check NT servers or any IP address on a network.

[www.tools4nt.com/Products/FREEping/FREEping.htm](http://www.tools4nt.com/Products/FREEping/FREEping.htm)

## Emergency Undelete

This freeware utility might come in handy in light of the recent virus scares. If you accidentally delete any data from command lines, applications or shared network drives, Emergency Undelete can recover that data from the hard disk. The Windows recycle bin only captures files deleted from Windows Explorer, but this tool fills in the gaps.

[www.executive.com](http://www.executive.com)

## NetKeep

With the proliferation of Web servers these days, administrators need an assistant just to keep track of them all. NetKeep provides data on Web servers that are live on a network and what software they are running. This shareware utility also keeps an archive of your server profiles.

[www.jwsg.com/netkeepinfo.html](http://www.jwsg.com/netkeepinfo.html)

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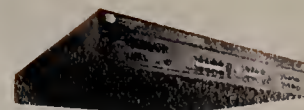


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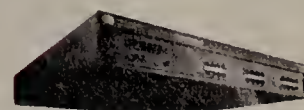


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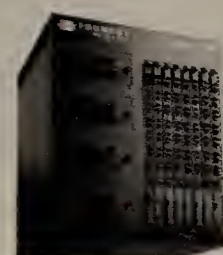
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## Wired Windows

Dave Kearns

## SERVER CRASH? IT'S YOUR FAULT, PAL

*"We have met the enemy, and he is us."*

— Pogo

**R**ecently on Network World Fusion we introduced the topic "Tell us your NT nightmares" and heard from a number of users complaining about frequent reboots, crashes and other troubles. We also heard from administrators whose NT servers run very well. What conclusions can we draw?

Before drawing a conclusion from the dozen or so responses, I visited the Windows NT server support news site at <http://msnews.microsoft.com> and, sure enough, there were lots of complaints about things that don't work, frequent reboots and crashed servers. "Hey!" I thought, "maybe there is something to these NT nightmares."

Still, I wanted to be sure that NT was somehow unique in its problems, so I went to the NetWare support forums at <http://forums.novell.com>. Funny thing, but most of the people posting messages there were also having problems with things that don't work correctly, frequent reboots and crashed servers.

I could go on and visit the OS/2 Warp server newsgroups, as well as those for VINES, Solaris, AIX and just about any networkable operating system and I'd most likely find the same result.

What does it all mean? Are all operating systems inherently unstable or is there another explanation? Here's the conclusion I draw: The biggest problem

with today's network servers is the system administrator. You, bucko.

Looking through the support forums for NT and NetWare, there are two major sources of problems — something is not configured correctly, or there aren't enough resources to accomplish the objective. In either case, the fault lies

squarely on the system administrator, not the operating system vendor. You have to know your network operating system intimately. You have to take the time to plan your network, servers and applications. You have to stay informed about developments, such as updates, affecting your system. You have to monitor your

network's health and administer cures proactively.

It's your job — do it right.

*Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at [wired@vquill.com](mailto:wired@vquill.com).*

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Many fax server companies would have you believe they offer an "Integrated Fax Solution" for Microsoft Exchange, when all they've done is connected your user community's Outlook client to their completely unintegrated server. It's hardly an integrated solution if you've got to manage an entirely separate set of hardware, software, analog telecom facilities and administrative tools.

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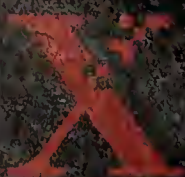
## Tip of The



One of the books I've mentioned here before — and praised highly — isn't selling well. I'm amazed that Richard Puckett's *Windows NT: Automated Deployment and Customization* isn't on the desk of every NT Server system administrator. Maybe you like personally visiting every server and desktop in order to roll out new applications, patches and updates, but to me that's a real time waster.



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# Why MPLS matters to enterprise networks

BY JIM DUFFY

**M**ulti-protocol Label Switching is an emerging Internet Engineering Task Force standard for scaling the Internet. MPLS performs this task by attaching "labels" to IP packets. The labels enable routers and switches to forward traffic based on information in the labels, rather than inspecting the different fields deep within each and every packet.

The less time devices spend inspecting traffic, the more time they have to forward it.

To date, MPLS has been marketed as a method by which service providers can engineer the traffic in their networks and offer IP services, such as virtual private networks (VPN) and quality-of-service (QoS)-based offerings. But what about companies that do not wish to outsource their WANs to a service provider? Can they benefit from MPLS?

The answer is, "Yes."

"Some of the large enterprises have private WANs on the scale of many ISPs or carriers," says David Passmore, president of NetReference, a consultancy in Sterling, Va. "Exactly the same issues come up."

MPLS is designed to steer packets across WANs in the same way ATM is designed to establish virtual circuits or paths for cells. But a big selling point of MPLS is that users can get ATM-like traffic engineering with or without ATM and its complex QoS and virtual circuit structures.

Indeed, MPLS is considered by many to be the best means available for integrating the raw speed of ATM with the familiarity of IP.

These same benefits can apply to enterprises as well as service providers, observers say. Enterprises can enhance IP QoS with MPLS by steering packets onto predetermined circuits or paths and gaining predictable performance for delay-sensitive applications, Passmore says. This method is in contrast to IP's traditional "send and pray" method of granting any available bandwidth or path, which tends to make performance unpredictable or less deterministic.

American Stores in Pleasanton, Calif., is looking at MPLS as a way to deliver QoS across its nationwide frame relay network. But the supermarket giant has not gone beyond the investigation stage.

"We're still making a determination as to what MPLS actually and truly is," says Chuck Ganguss, director of data networks at American Stores. "It may allow us to get to that one network environment for voice, data and video. That's one of the things that QoS protocols [in routers and switches] offered us. Now we're trying to determine whether MPLS is that or better."

Another MPLS benefit is the technology's ability to simplify the topologies of large router networks. MPLS helps to "flatten" hierarchical and hop-intensive routed infrastructures, which makes them easier to monitor, manage and operate, Passmore says.

A third benefit of MPLS is the basic traffic engi-

## MULTI-PROTOCOL LABEL SWITCHING

*Technology can support quality of service and simplify net management.*

neering aspect, irrespective of QoS. Users can control traffic flow more precisely in MPLS networks to avoid congested or bandwidth-constrained links, or those that are disabled.

But not every large enterprise can benefit from this feature; only private WANs configured in a complex mesh topology would need to engineer traffic.

implementing MPLS that are somewhat contradictory, and in some cases, not completely interoperable," he says. "So it may be a little early in the curve for end users to consider it. A service provider with a bigger economic advantage and better technical skills is a better target for the early implementation."

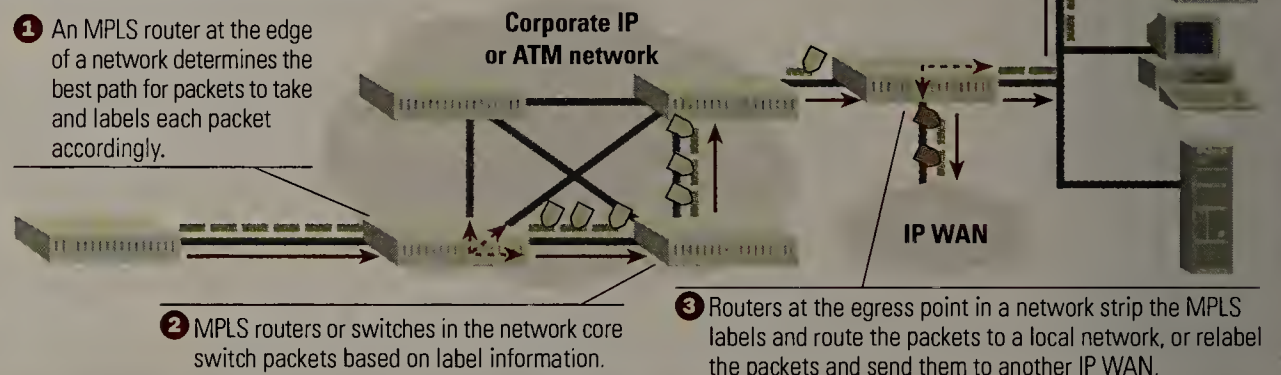
Indeed, Cisco recently said it would ship a version of its IOS routing software in July that supports MPLS and other VPN-specific functions. But the company's method for exchanging MPLS label tables among routers and switches uses the company's proprietary Tag Distribution Protocol, not the IETF-sanctioned Label Distribution Protocol (LDP).

Cisco says it will ship LDP in the fourth quarter, but some MPLS vendors say Cisco is selling IOS-based VPNs, not MPLS-based VPNs.

Other vendors say the MPLS standard is still a moving target. "There's still some ongoing work," says

### MPLS: Coming to an enterprise near you?

Here's how the technology works.



Point-to-point or star network configurations already have distinct routes.

"The enterprise would have to be running a fairly large network with a large number of trunks — not just a star configuration — in order for MPLS to be useful," says Tom Nolle, president of consultancy CIMI Corp. in Voorhees, N.J.

A project manager for the state of Wisconsin concurs.

"Our traffic here is more of a point-to-point, hub-type thing where the bulk of the traffic has remote ends and comes back to Madison," says Loren Lamphear, project manager for Wisconsin's BadgerNET. "We don't really have a true mesh-type network, where it's going every which direction. So I don't think we have an application for MPLS here right now."

Nolle also says it may be risky at this juncture for enterprises to embrace MPLS en masse. The technology is immature vs. ATM, and emerging standards such as MPLS are in the eye of the vendor/beholder.

"There is a large variety of vendor strategies for

John Fryer, director of marketing for advanced development at Harris & Jeffries, a Dedham, Mass., developer of MPLS software. "There's a proposal to use Resource Reservation Protocol with some specific extensions for traffic engineering. Certainly, this is something that we didn't initially see when we started our work, but we've now changed our plans to incorporate or develop the RSVP protocol as well."

Irrespective of the immaturity of MPLS, large enterprises can still benefit from the technology, says Paul Doolan, chief technology officer at network equipment maker Ennovate Networks in Boxborough, Mass. Large companies, for example, could benefit from the ability of MPLS to help separate different groups' network data, he says.

"MPLS is an encapsulation technology that holds the promise of being able to separate streams of data into closed user groups or a VPN," Doolan says. "By installing [MPLS-enabled gear], enterprises are putting in equipment that won't need to be forklifted out to do the next funky application that comes along. That's a clear win going forward for them." ■



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**1. What is the principal business activity at your location?** (check ONE only)

1. <input type="checkbox"/> Manufacturing (other)	10. <input type="checkbox"/> Education	19. <input type="checkbox"/> Systems/Network Integrators*
2. <input type="checkbox"/> Finance/Banking	11. <input type="checkbox"/> Government	20. <input type="checkbox"/> Distributors (Computer/Communications)*
3. <input type="checkbox"/> Insurance/Real Estate/Legal	12. <input type="checkbox"/> Military	21. <input type="checkbox"/> Other (please specify)
4. <input type="checkbox"/> Health Care Services	13. <input type="checkbox"/> Aerospace	
5. <input type="checkbox"/> Hospitality/Entertainment/Recreation	14. <input type="checkbox"/> Consulting (Independent)*	
6. <input type="checkbox"/> Media/TV/Cable/Radio/Print	15. <input type="checkbox"/> Carriers/Service Providers	
7. <input type="checkbox"/> Retail/Wholesale Trade/Business Services	16. <input type="checkbox"/> Internet Service Provider (ISP)	
8. <input type="checkbox"/> Transportation	17. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM)	
9. <input type="checkbox"/> Utilities/Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)	18. <input type="checkbox"/> Resellers Of Computer/Network Products (VARs,VADs)*	

\*Attn Consultants, Integrators, Distributors, Resellers: Please complete entire form based on ALL clients and own business needs

**2. P: What is your primary job function?** (check ONE only)  
**S: What is your secondary job function?** (check ALL that apply)

P	S	P	S	P	S
<input type="checkbox"/> 1. <input type="checkbox"/> Network Management	<input type="checkbox"/> 5. <input type="checkbox"/> Internet/Intranet/E-Commerce Mgmt, Webmaster	<input type="checkbox"/> 7. <input type="checkbox"/> Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)		<input type="checkbox"/> 8. <input type="checkbox"/> Consultant (Independent)	
<input type="checkbox"/> 2. <input type="checkbox"/> LAN Management	<input type="checkbox"/> 6. <input type="checkbox"/> Engineering Management	<input type="checkbox"/> 9. <input type="checkbox"/> Other (please specify)			
<input type="checkbox"/> 3. <input type="checkbox"/> Datacom/Telecom Management					
<input type="checkbox"/> 4. <input type="checkbox"/> IS/IT/MIS/CIO/CTO/Systems Management					

**3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of?** (Please print the appropriate number code on the line next to each product category. Please complete ALL categories A-N.)

1. <input type="checkbox"/> \$100 Million or more	A <input type="checkbox"/> Large Systems (Mainframes/Minis)	G <input type="checkbox"/> Internetworking
2. <input type="checkbox"/> \$50 Million to \$99.9 Million	B <input type="checkbox"/> Desktops (Micros/Laptops/Workstations/PDAs)	H <input type="checkbox"/> Internet
3. <input type="checkbox"/> \$25 Million to \$49.9 Million	C <input type="checkbox"/> Servers	I <input type="checkbox"/> Intranet
4. <input type="checkbox"/> \$10 Million to \$24.9 Million	D <input type="checkbox"/> LANs	J <input type="checkbox"/> Extranet/Ecommerce
5. <input type="checkbox"/> \$1 Million to \$9.9 Million	E <input type="checkbox"/> WAN Equipment	K <input type="checkbox"/> Remote Access
6. <input type="checkbox"/> \$100,000 to \$999,999	F <input type="checkbox"/> Carrier Services	L <input type="checkbox"/> Peripherals (including storage)
7. <input type="checkbox"/> \$50,000 to \$99,999		M <input type="checkbox"/> Software
8. <input type="checkbox"/> Under \$50,000		N <input type="checkbox"/> Service/Support
9. <input type="checkbox"/> None of the above		

**4. What is the total number of sites for which you have purchase influence?** (check ONE only)

1. ☐ 100+ 2. ☐ 50-99 3. ☐ 20-49 4. ☐ 10-19 5. ☐ 2-9 6. ☐ 1 7. ☐ None

**5. What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization?** (check ONE box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

**6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?**

<b>A. Scope</b> (check ONE only)	<b>B. Involvement</b> (check ALL that apply)
CORPORATE:	
1. <input type="checkbox"/> Entire Enterprise/Multiple Enterprises	1. <input type="checkbox"/> Create Network/IT Strategy
2. <input type="checkbox"/> Division/Multiple Divisions	2. <input type="checkbox"/> Recommend/Specify Brand
3. <input type="checkbox"/> Department	3. <input type="checkbox"/> Approve Purchase
4. <input type="checkbox"/> None	4. <input type="checkbox"/> Evaluate Products/Services
	5. <input type="checkbox"/> Determine the Need
	6. <input type="checkbox"/> None

**7. What is the estimated number of employees at your location/in entire organization?** (check ONE in each section)

A. At your location:		B. Entire organization:	
1. <input type="checkbox"/> Over 20,000	6. <input type="checkbox"/> 500-999	1. <input type="checkbox"/> Over 20,000	5. <input type="checkbox"/> 1,000-2,499
2. <input type="checkbox"/> 10,000-19,999	7. <input type="checkbox"/> 250-499	2. <input type="checkbox"/> 10,000-19,999	6. <input type="checkbox"/> 500-999
3. <input type="checkbox"/> 5,000-9,999	8. <input type="checkbox"/> 100-249	3. <input type="checkbox"/> 5,000-9,999	7. <input type="checkbox"/> 499 or less
4. <input type="checkbox"/> 2,500-4,999	9. <input type="checkbox"/> 99 or less	4. <input type="checkbox"/> 2,500-4,999	
5. <input type="checkbox"/> 1,000-2,499			

**8. Please indicate the Internet/Intranet/LAN/WAN products/services that you are currently involved in purchasing or plan to purchase** (check ALL that apply)

A. Currently involved in purchasing		B. Plan to purchase	
INTERNET/INTRANET			
<input type="checkbox"/> 1. <input type="checkbox"/> VPN Equipment	<input type="checkbox"/> 7. <input type="checkbox"/> Voice/Video over IP (IP Multicast Routing)	<input type="checkbox"/> 12. <input type="checkbox"/> Management/Monitoring Software	
<input type="checkbox"/> 2. <input type="checkbox"/> VPN Services	<input type="checkbox"/> 8. <input type="checkbox"/> Internet Services	<input type="checkbox"/> 13. <input type="checkbox"/> Web Based Management Tools	
<input type="checkbox"/> 3. <input type="checkbox"/> Firewalls/Security/Encryption	<input type="checkbox"/> 9. <input type="checkbox"/> Web Hosting	<input type="checkbox"/> 14. <input type="checkbox"/> Web Based Collaboration/Groupware	
<input type="checkbox"/> 4. <input type="checkbox"/> Electronic Commerce	<input type="checkbox"/> 10. <input type="checkbox"/> Host Access	<input type="checkbox"/> 15. <input type="checkbox"/> Caching/Load Balancing Products	
<input type="checkbox"/> 5. <input type="checkbox"/> Web Servers/Software	<input type="checkbox"/> 11. <input type="checkbox"/> Web Development Tools	<input type="checkbox"/> 16. <input type="checkbox"/> Other Internet/Intranet	
<input type="checkbox"/> 6. <input type="checkbox"/> Web Enabled Call Center Tools			
LOCAL-AREA NETWORKS/INTERNETWORKING			
<input type="checkbox"/> 17. <input type="checkbox"/> Local-Area Networks	<input type="checkbox"/> 25. <input type="checkbox"/> Layer 2 Switches	<input type="checkbox"/> 33. <input type="checkbox"/> UP5	
<input type="checkbox"/> 18. <input type="checkbox"/> Network Operating System Software (NOS)	<input type="checkbox"/> 26. <input type="checkbox"/> Layer 3 Switches	<input type="checkbox"/> 34. <input type="checkbox"/> Network Interface Cards (NICs,PCMCIA)	
<input type="checkbox"/> 19. <input type="checkbox"/> Intel Based Servers	<input type="checkbox"/> 27. <input type="checkbox"/> Layer 4 Switches	<input type="checkbox"/> 35. <input type="checkbox"/> Hubs/Intelligent Hubs/Stackable Hubs	
<input type="checkbox"/> 20. <input type="checkbox"/> Intel Based Multiprocessor Servers	<input type="checkbox"/> 28. <input type="checkbox"/> ATM Switches	<input type="checkbox"/> 36. <input type="checkbox"/> Cables,Connectors,Baluns	
<input type="checkbox"/> 21. <input type="checkbox"/> RISC Based Servers	<input type="checkbox"/> 29. <input type="checkbox"/> Token-Ring Switches	<input type="checkbox"/> 37. <input type="checkbox"/> SNMP Platform	
<input type="checkbox"/> 22. <input type="checkbox"/> Clustered Servers	<input type="checkbox"/> 30. <input type="checkbox"/> Network Storage (NAS, SANs)	<input type="checkbox"/> 38. <input type="checkbox"/> Management Frameworks	
<input type="checkbox"/> 23. <input type="checkbox"/> Print Servers	<input type="checkbox"/> 31. <input type="checkbox"/> Storage/Backup (Optical, Disk, Tape, RAID)	<input type="checkbox"/> 39. <input type="checkbox"/> Other LAN/Internetworking	
<input type="checkbox"/> 24. <input type="checkbox"/> Routers	<input type="checkbox"/> 32. <input type="checkbox"/> Network Test/Diagnostic Tools		
WAN EQUIPMENT & SERVICES			
<input type="checkbox"/> 40. <input type="checkbox"/> Modems	<input type="checkbox"/> 46. <input type="checkbox"/> Remote Access Services	<input type="checkbox"/> 53. <input type="checkbox"/> PBXs	
<input type="checkbox"/> 41. <input type="checkbox"/> Cable Modems	<input type="checkbox"/> 47. <input type="checkbox"/> Wireless Data Equipment/Services	<input type="checkbox"/> 54. <input type="checkbox"/> Videoconferencing	
<input type="checkbox"/> 42. <input type="checkbox"/> Asynchronous Transfer Mode (ATM)	<input type="checkbox"/> 48. <input type="checkbox"/> ISDN Equipment/Services	<input type="checkbox"/> 55. <input type="checkbox"/> Managed LAN/Router Services	
<input type="checkbox"/> 43. <input type="checkbox"/> Frame Relay Equipment including FRADs	<input type="checkbox"/> 49. <input type="checkbox"/> FT-1/T-1/T-3 Services	<input type="checkbox"/> 56. <input type="checkbox"/> Fax Servers/Services	
<input type="checkbox"/> 44. <input type="checkbox"/> Frame Relay Services	<input type="checkbox"/> 50. <input type="checkbox"/> xDSL Services/Products	<input type="checkbox"/> 57. <input type="checkbox"/> Other WAN Equipment/Services	
<input type="checkbox"/> 45. <input type="checkbox"/> Remote Access Products	<input type="checkbox"/> 51. <input type="checkbox"/> Diagnostic/Test Equipment		
	<input type="checkbox"/> 52. <input type="checkbox"/> DSU/CSU	None of the above (1-57)	<input type="checkbox"/> 58. <input type="checkbox"/>

**9. Please indicate the Network hardware/software/services that you are currently involved in purchasing or plan to purchase:** (check ALL that apply)

A. Currently involved in purchasing		B. Plan to purchase	
COMPUTERS/PERIPHERALS			
<input type="checkbox"/> 1. <input type="checkbox"/> Laptops/Notebooks/PDAs	<input type="checkbox"/> 5. <input type="checkbox"/> Storage/Backup (Optical,Disk,Tape,RAID)	<input type="checkbox"/> 8. <input type="checkbox"/> Minis	
<input type="checkbox"/> 2. <input type="checkbox"/> PCs	<input type="checkbox"/> 6. <input type="checkbox"/> Printers	<input type="checkbox"/> 9. <input type="checkbox"/> Mainframes	
<input type="checkbox"/> 3. <input type="checkbox"/> Windows Terminals/Thin Clients	<input type="checkbox"/> 7. <input type="checkbox"/> Printer/Fax/Copier Hybrids (Multifunction Printers)	<input type="checkbox"/> 10. <input type="checkbox"/> Fax/Modem Boards	
<input type="checkbox"/> 4. <input type="checkbox"/> Workstations		<input type="checkbox"/> 11. <input type="checkbox"/> Memory/Chips/Boards/Cards	
<input type="checkbox"/> 12. <input type="checkbox"/> Other Computers/Peripherals			
SOFTWARE/APPLICATIONS			
<input type="checkbox"/> 13. <input type="checkbox"/> Network Management	<input type="checkbox"/> 21. <input type="checkbox"/> E-Mail	<input type="checkbox"/> 28. <input type="checkbox"/> Site Metering Tools	
<input type="checkbox"/> 14. <input type="checkbox"/> Systems Management	<input type="checkbox"/> 22. <input type="checkbox"/> Enterprise Resource Planning (ERP)	<input type="checkbox"/> 29. <input type="checkbox"/> Data Warehousing	
<input type="checkbox"/> 15. <input type="checkbox"/> Security	<input type="checkbox"/> 23. <input type="checkbox"/> EDI	<input type="checkbox"/> 30. <input type="checkbox"/> Anti Virus Software	
<input type="checkbox"/> 16. <input type="checkbox"/> Directory Services	<input type="checkbox"/> 24. <input type="checkbox"/> Desktop Videoconferencing	<input type="checkbox"/> 31. <input type="checkbox"/> Multimedia	
<input type="checkbox"/> 17. <input type="checkbox"/> Operating Systems	<input type="checkbox"/> 25. <input type="checkbox"/> Imaging	<input type="checkbox"/> 32. <input type="checkbox"/> Y2K Conversion Software	
<input type="checkbox"/> 18. <input type="checkbox"/> Applications Development Tools	<input type="checkbox"/> 26. <input type="checkbox"/> Middleware/Serverware	<input type="checkbox"/> 33. <input type="checkbox"/> Helpdesk	
<input type="checkbox"/> 19. <input type="checkbox"/> Database Management/RDBMS	<input type="checkbox"/> 27. <input type="checkbox"/> Document Management	<input type="checkbox"/> 34. <input type="checkbox"/> Other Software/Applications	
<input type="checkbox"/> 20. <input type="checkbox"/> Groupware			
SERVICES			
<input type="checkbox"/> 35. <input type="checkbox"/> BPO (Business Process Outsourcing incl. Financial Services, HR, Logistics etc.)	<input type="checkbox"/> 36. <input type="checkbox"/> Applications Outsourcing	<input type="checkbox"/> 39. <input type="checkbox"/> Education/Training Services	
	<input type="checkbox"/> 37. <input type="checkbox"/> Call Center Outsourcing	<input type="checkbox"/> 40. <input type="checkbox"/> Other Services	
	<input type="checkbox"/> 38. <input type="checkbox"/> Systems Integration/Consulting	None of the above (1-40)	<input type="checkbox"/> 41. <input type="checkbox"/>

**10. Please indicate the platforms that are currently installed/planned:** (check ALL that apply)

A. Currently installed		B. Planned for purchase	
NETWORK PROTOCOLS			
<input type="checkbox"/> 01. <input type="checkbox"/> TCP/IP	<input type="checkbox"/> 04. <input type="checkbox"/> Novell IPX/SPX	<input type="checkbox"/> 07. <input type="checkbox"/> NFS	
<input type="checkbox"/> 02. <input type="checkbox"/> IPv6	<input type="checkbox"/> 05. <input type="checkbox"/> APPC/APPN/LU 6.2	<input type="checkbox"/> 08. <input type="checkbox"/> 5NMP	
<input type="checkbox"/> 03. <input type="checkbox"/> SNA	<input type="checkbox"/> 06. <input type="checkbox"/> NETBIOS/NETBUEI	<input type="checkbox"/> 09. <input type="checkbox"/> Other Network Protocols	
LAN/WAN ENVIRONMENT			
<input type="checkbox"/> 10. <input type="checkbox"/> Gigabit Ethernet	<input type="checkbox"/> 16. <input type="checkbox"/> IP Switching	<input type="checkbox"/> 22. <input type="checkbox"/> Wireless	
<input type="checkbox"/> 11. <input type="checkbox"/> Switched Ethernet	<input type="checkbox"/> 17. <input type="checkbox"/> Layer 3,4 Switching	<input type="checkbox"/> 23. <input type="checkbox"/> DSL	
<input type="checkbox"/> 12. <input type="checkbox"/> Fast Ethernet	<input type="checkbox"/> 18. <input type="checkbox"/> FDDI	<input type="checkbox"/> 24. <input type="checkbox"/> ISDN	
<input type="checkbox"/> 13. <input type="checkbox"/> Ethernet	<input type="checkbox"/> 19. <input type="checkbox"/> 100Base-T	<input type="checkbox"/> 25. <input type="checkbox"/> Frame Relay	
<input type="checkbox"/> 14. <input type="checkbox"/> ATM	<input type="checkbox"/> 20. <input type="checkbox"/> 10Base-T	<input type="checkbox"/> 26. <input type="checkbox"/> Private Line T1, T3, FT-1, SONET	
<input type="checkbox"/> 15. <input type="checkbox"/> Token Ring/Token Ring Switching	<input type="checkbox"/> 21. <input type="checkbox"/> Fibre Channel	<input type="checkbox"/> 27. <input type="checkbox"/> Other LAN/WAN Environment	
NETWORK OPERATING SYSTEM			
<input type="checkbox"/> 28. <input type="checkbox"/> Windows NT/Windows 2000	<input type="checkbox"/> 32. <input type="checkbox"/> LINUX	<input type="checkbox"/> 35. <input type="checkbox"/> IBM (LAN Server)	
<input type="checkbox"/> 29. <input type="checkbox"/> Novell (NetWare 5.X)	<input type="checkbox"/> 33. <input type="checkbox"/> Microsoft (LAN Manager)	<input type="checkbox"/> 36. <input type="checkbox"/> Other Network Operating System	
<input type="checkbox"/> 30. <input type="checkbox"/> Novell (NetWare 4.X)	<input type="checkbox"/> 34. <input type="checkbox"/> Banyan (Vines)		
<input type="checkbox"/> 31. <input type="checkbox"/> Novell (NetWare 2.X,3.X)			
COMPUTER OPERATING SYSTEM			
<input type="checkbox"/> 37. <input type="checkbox"/> NT Workstation	<input type="checkbox"/> 42. <input type="checkbox"/> LINUX	<input type="checkbox"/> 47. <input type="checkbox"/> Digital VMS	
<input type="checkbox"/> 38. <input type="checkbox"/> Windows 2000	<input type="checkbox"/> 43. <input type="checkbox"/> DOS	<input type="checkbox"/> 48. <input type="checkbox"/> Macintosh	
<input type="checkbox"/> 39. <input type="checkbox"/> Windows 98/95/3.1	<input type="checkbox"/> 44. <input type="checkbox"/> OS/2,OS/2 WARP	<input type="checkbox"/> 49. <input type="checkbox"/> Other Computer Operating System	
<input type="checkbox"/> 40. <input type="checkbox"/> Intel based UNIX	<input type="checkbox"/> 45. <input type="checkbox"/> OS/400		
<input type="checkbox"/> 41. <input type="checkbox"/> RISC based UNIX (incl. SOLARIS)	<input type="checkbox"/> 46. <input type="checkbox"/> IBM MVS/VM/SE/ESA	None of the above (1-49)	<input type="checkbox"/> 50. <input type="checkbox"/>

**11. Which of the following hardware platforms are installed/planned in your company?** (check ALL that apply)

<b>A - Mainframes (Large Scale)</b>	<b>B - Minis (Midrange)</b>	<b>C - Workstations</b>
1. <input type="checkbox"/> IBM	1. <input type="checkbox"/> IBM RS/6000	1. <input type="checkbox"/> Sun Microsystems
2. <input type="checkbox"/> Other	2. <input type="checkbox"/> IBM AS/400	2. <input type="checkbox"/> H-P
	3. <input type="checkbox"/> Digital/Tandem/Compaq	3. <input type="checkbox"/> Digital/Compaq
	4. <input type="checkbox"/> Unisys	4. <input type="checkbox"/> IBM
	5. <input type="checkbox"/> H-P	5. <input type="checkbox"/> Silicon Graphics
	6. <input type="checkbox"/> Other	6. <input type="checkbox"/> Other

**12. What is the estimated gross revenue of your entire company/institution?** (check ONE only)

1. <input type="checkbox"/> \$100 Million or More	5. <input type="checkbox"/> \$10 Million to \$19.9 Million	9. <input type="checkbox"/> \$250,000 to \$499,999
2. <input type="checkbox"/> \$50 Million to \$99.9 Million	6. <input type="checkbox"/> \$5 Million to \$9.9 Million	10. <input type="checkbox"/> \$100,000 to \$249,999
3. <input type="checkbox"/> \$25 Million to \$49.9 Million	7. <input type="checkbox"/> \$1 Million to \$4.9 Million	11. <input type="checkbox"/> None of the above
4. <input type="checkbox"/> \$20 Million to \$24.9 Million	8. <input type="checkbox"/> \$500,000 to \$999,999	

**13. For which areas outside of the US do you have purchase influence?** (check ALL that apply)

1. <input type="checkbox"/> Europe	3. <input type="checkbox"/> South America	5. <input type="checkbox"/> Middle East	8. <input type="checkbox"/> Canada
2. <input type="checkbox"/> Asia	4. <input type="checkbox"/> Australia	7. <input type="checkbox"/> Africa	9. <input type="checkbox"/> None



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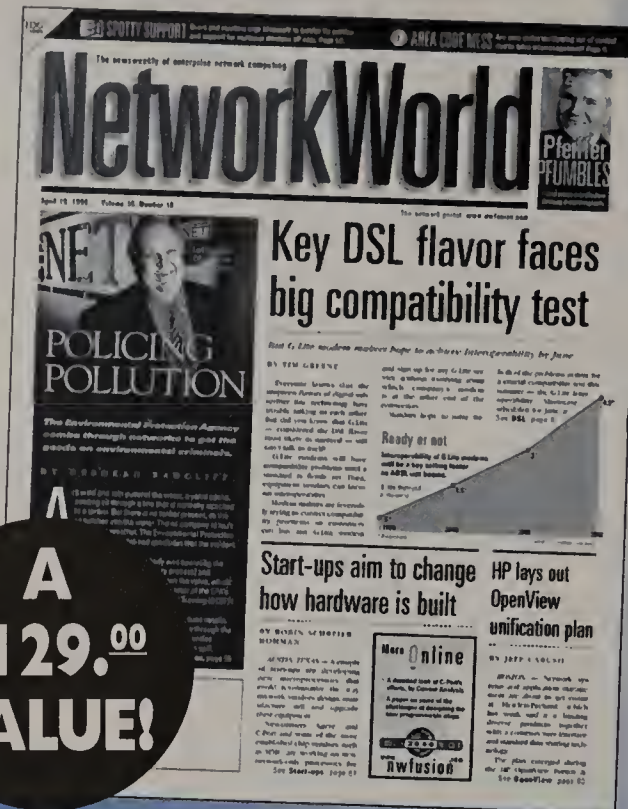
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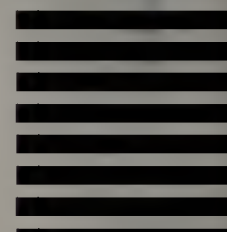
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# Carriers & ISPs

The Internet, Extranets, Interexchange  
and Local Carriers, Wireless, Regulatory Affairs

## Briefs

The global venture between AT&T and British Telecommunications has resulted in the naming of several key officials.

Nancy Gofus was named president of global products and services. She comes from Concert,



**David Dorman** was named CEO of a new global venture.

where she was chief operating officer. Neil Hobbs will be president of global markets. David Nagel, chief technology officer at AT&T and president of AT&T Labs, will also become CTO of the global venture. Earlier David Dorman, former Sprint and Pacific Bell official, was named CEO of the company.

AT&T WorldNet announced last week that it will roll out OC-3 (155M bit/sec) and OC-12 (622M bit/sec) dedicated Internet access services in the fourth quarter. The services will initially be available in a handful of metropolitan areas, with general availability not coming until the first half of 2000. Pricing for AT&T's high-speed Internet access services will not be available until the fourth quarter. AT&T is also in the process of evaluating OC-192 backbone equipment to upgrade its IP net.

AT&T WorldNet: (908) 221-2000

HarvardNet, a competitive local exchange carrier in Boston, last week filed with the Securities and Exchange Commission for the initial public offering of its common stock. The company, which posted a loss last year, offers a variety of services, from Web hosting to digital subscriber line Internet access. The company is using Morgan Stanley Dean Witter as its lead underwriter.

## Upstart carrier keys on convergence

BY TIM GREENE

TAMPA, FLA. — 2nd Century Communications wants to win your business away from the local monopoly phone company — and not by just undercutting prices.

The start-up wants to offer a raft of services, all over a single connection to the customer site. These services will include Internet access, e-mail, Web hosting, local and long-distance phone service, unified messaging, virtual private networks and network-based applications.

To deliver these converged services, the carrier is banking on a new breed of equipment and suppliers. Unlike existing carriers, 2nd Century has the luxury of being able to start from scratch with the latest and greatest technology.

The carrier is also purchasing network elements, such as long-distance trunks, local T-1 access lines and a voice signaling network, from other

providers.

Using this combination of network facilities and equipment is the best way to build a competitive local exchange carrier (CLEC) network that will remain viable even after the regional Bell operating companies start selling long-distance services, says 2nd Century Chairman Mike Viren.

Viren, a former economics professor and ex-head of strategic planning for frame relay carrier Intermedia Communications, says the key to 2nd Century's success will be the company's use of ATM in the local loop.

### PROFILE: 2ND CENTURY COMMUNICATIONS



**Chairman Mike Viren**

<b>Headquarters:</b>	Tampa, Fla.
<b>Founded:</b>	1998
<b>Services:</b>	Internet access, e-mail, Web hosting, local and long-distance phone, unified messaging and virtual private networks
<b>Employees:</b>	60
<b>Funding:</b>	\$30 million total from Accel Partners, North Bridge and Venrock Associates
<b>Competitors:</b>	RBOCs, CLECs
<b>Fun fact:</b>	The company name comes from the fact that telephony is entering its second century.



## Cable & Wireless' troubled Internet road

*Snafus dog company's MCI Internet buy.*

BY DENISE PAPPALARDO  
AND DAVID ROHDE

From poor customer service to lawsuits, the sale of MCI's Internet business to Cable & Wireless has to be considered one of the more troublesome business deals of the past 24 months.

The latest snafu comes courtesy of MCI WorldCom. When Cable & Wireless bought MCI's Internet business, the two companies made another deal: all MCI frame relay customers that connect to the MCI Internet backbone were to be moved to MCI WorldCom's UUNET network. But MCI WorldCom has not lived up to its end of the deal.

Today, Cable & Wireless has gateways between its Internet network and MCI WorldCom's frame relay network. These gateways let legacy MCI frame customers access Cable & Wireless' network using dedicated permanent virtual circuits (PVC). But Cable & Wireless could have turned off those gateways June 1, 1999 according to a

source close to MCI WorldCom. A Cable & Wireless spokeswoman also confirmed the agreed-upon deadline.

But Cable & Wireless officials never received a detailed schedule from MCI to accomplish this, she says. So instead of just turning off the gateways and leaving MCI frame customers in the lurch, the service provider decided to leave the circuits on.

Over Memorial Day weekend "one of our guys received a call [from an MCI] See **Cable & Wireless**, page 36

The link between a customer location and the phone company is the most expensive in any phone network, Viren says. ATM can make local-loop bandwidth usage more cost-efficient by cutting up each link between a carrier and its customers into virtual circuits that support separate qualities of service and don't waste any bandwidth.

IP does offer class of service, but you still need to throw extra bandwidth at your traffic to guarantee a certain level of delay. And that can get expensive, Viren says.

"I really need to sell all my bandwidth in the local loop and even oversubscribe it," Viren says.

The 2nd Century network design calls for a server at the customer site that consolidates traffic from LANs, phones and other sources, and then converts it to ATM for transport across a T-1. The company is considering gear from newcomers such as Mariposa, Woodwind and Praxon.

The traffic will then be collected by an ATM concentrator/switch located in a 2nd Century point of presence, perhaps in the local switching office of an RBOC. That device takes in multiple T-1s, sorts traffic by type and passes it along. Start-ups Convergent Communications and Tachion are among contenders to provide these switches.

The concentrator/switches have time-division multiplexing ports for carrying voice traffic to traditional local and long-distance voice networks, and IP ports for Internet traffic.

See **2nd Century**, page 36

### More Online

- An overview of other issues surrounding MCI's transfer of its customers to Cable & Wireless.
- A look at Cable & Wireless' efforts to crack the U.S. IP market.





# Applicast to host ERP applications

BY DENISE PAPPALARDO

Newcomer Applicast this week will formally introduce a pair of rentable software services designed to make high-end applications more accessible to business users.

Applicast is offering business users SAP financial and Siebel Systems sales force management software hosted on Compaq servers running Windows NT, says John McGrory, president and CEO at the Mountain View, Calif., start-up.

Later this year, Applicast expects to expand its hosted software services with data warehousing and electronic commerce applications.

The applications are accessible via the Internet or over frame relay connections.

But Applicast, like other companies in the emerging application service provider (ASP) market, does not provide customers with network

limited number of customers, including Flash Electronics and CoSign Communications.

CoSign, a new carrier switch manufacturer in Redwood, City, Calif., is using Applicast's SAP and Siebel services.

It would have been tough for a new company such as CoSign to get such sophisticated back-end applications up and running in house while also trying to get the business launched, says Curtis Dudnick, CoSign's chief financial officer. The temptation would have been to start with lower-end applications and migrate SAP and Siebel later, but that can be inefficient, he says.

**Software for hire**

**Applicast is the latest company to jump into the application service provider market. Here's a rundown of the company's initial offerings:**

Application	Price per month
SAP financial and manufacturing software	\$10,000 to \$15,000 (for 20 users)
Siebel Systems sales force automation, marketing and customer service software	\$8,000 to \$12,000 (for 20 users)

access services.

For those services, customers must go to separate ISPs or carriers.

Applicast has already started offering the services to a

its own data centers to house its customers' servers and applications. Rather, Applicast is collocating all its servers in GTE Data Systems' data center in Tampa, Fla. Corio is taking a similar approach through its relationship with Exodus Communications.

Applicast engineers monitor and manage customers' servers from Applicast's headquarters through a dedicated T-1 link to GTE's data center.

GTE has three other data centers in the U.S. that Applicast will also use in the future. Applicast's McGrory points out that the company can today support mirrored servers at other locations, but that the company's current customers have not asked for that type of support to date.

Applicast started a year ago under the name Plenar Systems. In the past year, the company received its first round of venture capital from Sippl Macdonald Ventures and MKS Ventures.

Applicast: (650) 210-0270

# FCC moves to curb countrywide phone-number shortages

*Commission warns carriers that large-scale changes could be in the works if problems are not solved soon.*

BY DAVID ROHDE

WASHINGTON, D.C. — The Federal Communications Commission has decided to try to fix the nation's phone number problems — marked by constant area code changes — with a grab-bag of proposals.

But the FCC is likely to have a fight on its hands with the 125-page "Notice of Proposed Rulemaking" that the agency recently released.

Among its proposals is one letting states establish area codes specifically for wireless carriers or other "technology-specific" uses. The trade associations for wireless carriers have bitterly fought this idea in the past.

And the FCC put all carriers on notice that it is going to resist that old telecom bugaboo — line-item user surcharges to pay for new mandates from the government to carriers.

Before the FCC issued its proposal, the North American Numbering Council — made up of carrier interest groups

from the telecom industry — said in a report that "cost-recovery mechanisms loom as high priorities before going forward" with area code fixes.

The FCC is trying to deflect that demand. In its proposal, the FCC said it had "tentatively concluded" that any fixes should be paid for out of the existing funding formula for the country's numbering plan — in other words, without a line item.

Although the FCC said it was considering a number of proposals, one lies at the heart of the agency's efforts. The commission said it strongly favored a system called "thousands-block number pooling" to stop area codes from being depleted so quickly.

Currently, phone numbers are assigned to carriers only in blocks of 10,000. Because numerous competitive local exchange carriers are clamoring for numbers in the same localities as RBOCs, even if they may have only a handful of customers, the

10,000-blocks are being used up at a pace the industry cannot sustain. As a result, "new area codes are being activated throughout North America at an alarming rate," the report says.

Under thousands-block pooling, telco switch software would be rewritten to recognize carrier blocks of 1,000 rather than 10,000 numbers. The FCC said an alternative proposal in which numbers could be assigned to carriers one at a time was too complex.

Even at that, the FCC said it was proposing that thousands-block pooling initially be limited to the 100 largest metropolitan areas, the first areas where local number portability was rolled out. And even then, the North American Numbering Council estimates that thousands-block number pooling will take 10 to 19 months to implement once the FCC gives the order — which itself is unlikely until next year.

Behind the scenes the tele-

## Gotta do something

**The FCC is requesting comment on the following proposals to ensure that the country's telephone numbers don't run out:**

1. Allow carriers to reserve numbers for a maximum of 45 days before giving them back.\*
2. Force carriers to utilize a certain percentage of numbers in each exchange before they ask for more exchanges.\*\*
3. Reduce the number of "rate centers" in each area code that define mileage for short-haul toll calls.
4. Implement a "thousands-block number pooling" system.
5. Let states implement wireless-only or other technology-specific area codes.
6. Require carriers to pay for the telephone numbers they reserve.

\* Such a rule is currently in effect for toll-free numbers but not regular numbers.

\*\* Under this proposal, CLECs might be allowed a smaller percentage than RBOCs.

com industry has begged the FCC not to order any new mandates affecting switching systems until the Year 2000 crisis is safely past.

In the notice, the FCC also urged carriers not to simply write in and say the proposed fixes would cost too much money.

The agency asked the carriers to compare the costs of any fixes against the cost of

changing the country's entire numbering system — such as going to an area code plus eight digits — as it warned could happen in a few years if nothing is done.

Among its other proposals, the FCC is also considering charging carriers for numbers. But the agency indicated more willingness to let that proposal slide if comments run against the idea. ▀





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**Cable & Wireless,**  
continued from page 33

frame relay user] saying, 'Don't turn us down. We're not prepared to have this happen,' " the Cable & Wireless spokeswoman says.

While MCI WorldCom sorts out its frame relay customer migration plan, Cable & Wireless' lawsuit against the service provider is moving ahead.

In late March, Cable & Wireless filed suit against MCI claiming that MCI did forward pertinent customer information or supply enough staff to support the Internet business that MCI sold off.

And Cable & Wireless is still working on transition issues of its own. In the midst of customer complaints about poor Internet service, Cable & Wireless went on a hiring spree earlier this year.

But then the service provider sent another blow to its dial-up Internet access customers in May by announcing that it plans to sell this part of its business to Prodigy for \$50 million to \$75 million. ■

**2nd Century,**  
continued from page 33

Viren says 2nd Century can make money using this network model with as few as 125 customers per switch.

That's because the switches cost only one-tenth as much as traditional voice switches.

"We get revenue right away, and that cash flow leads to profitability sooner," Viren says.

One switch means one operations and support system (OSS) to gather data about traffic for billing — one of the more complicated aspects of being a service provider.

The more different types of switches there are in a network, the tougher it is to handle OSS, Viren says.

Traditional carriers, including some CLECs, require voice switches, frame relay switches and large routers.

They also need a separate signaling network to complete voice calls to customers of the established phone carriers.

"That's expensive. That's too many protocols," Viren says. "I need to choose one and put all my traffic on that."

2nd Century plans a two-year rollout

of services in 50 cities in 40 states starting in October.

2nd Century: (813) 935-8866 or [www.2c2.com](http://www.2c2.com)

## ATM IN THE LOCAL LOOP

**T**elecom hardware and service providers are trying to make it easier to converge all kinds of traffic onto the local-loop portion of public data networks.

Seven companies recently formed the ATM Local Telephone Alliance (ALTA) to promote interoperability among ATM-based carrier gear so it supports full-featured voice, video and data services.

While ATM standards ensure general interoperability, some phone features are not covered, according to Mike Viren, chairman of 2nd Century Communications, a founding member of ALTA.

For example, ATM gear in a service

provider network needs to be able to access the 911 and 411 phone systems, as well as generate ringing tones on the line. ATM standards don't cover those kinds of things, Viren says.

ALTA members hope that by banding together, they can make leading suppliers such as Lucent and Nortel Networks better hear their voices.

Other founding ALTA members are Advanced Switching Communications, Convergent Networks, Mariposa Technologies, Unisphere Solutions, Vina Technologies and Woodwind Communications.

— Tim Greene

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Wan Monitor . Daniel Briere and Christine Heckart

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**A**s your firm opens a new office or expands into new territories, is "fiber-accessible" on your list of demands? It should be. Access to fiber is more important than those extra parking spaces you're probably insisting on.

The rate of innovation in photonics and optics is almost as rapid as the rate of obsolescence in today's network equipment. These optical innovations will change the way we buy communications services, which services we buy and the way we pay for them.

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Most of the improvements in optics

involve increased densities of wavelengths on a single fiber. Otherwise they're about the consolidation into a single device of functions that previously were segregated, such as adding/dropping multiplexers, wavelength division multiplexing, cross connection and even routing.

There are nearly 100,000 buildings in the U.S. that are already fiber-enabled, with more being added daily. The rest of us are fiber-challenged and may be at a significant disadvantage.

How big a disadvantage? The fiber "haves" may be able to purchase an OC-3 of local bandwidth for what the "have nots" pay for a copper-based fractional T-1. "No way," you say? Companies such as FiberNet and Allied Riser, among many others, are taking huge chunks of fiber to individual floors in multitenant buildings. They

have no customer base to protect, no fat layer of middle management to feed and no 100-year history of process and procedure to slowly automate and streamline. They have only a need to get your business, get it fast and generate a return on their invested millions.

In the long-haul network, the cost of transmission is less than 20% of operating cost, and dropping. So why do we have private-line pricing based on mileage? Why are phone calls still sensitive to call duration? And if we can now put 80 wavelengths across a single fiber, why is there still such a big difference in pricing between 64K bit/sec and 45M bit/sec?

The answers are simple: convention, inefficiency and greed. The established service providers don't want to take a big chunk out of their revenue base by passing along the savings they reap

from hardware innovation. And their own innovation in process management, automation and operational efficiency has not kept pace with the innovations of their equipment suppliers.

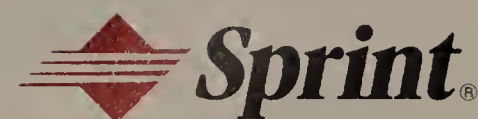
If you are on fiber, you'll be able to deploy network-hosted applications to reduce costs; implement high-quality desktop conferencing; upgrade the extranet with high-speed links and multimedia for competitive advantage; or create the baddest electronic commerce site on the 'Net to boost revenue. And if you're not? You'll be at a competitive disadvantage, stagnating in the copper backwaters.

*Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at [dbriere@telechoice.com](mailto:dbriere@telechoice.com) and [heckart@telechoice.com](mailto:heckart@telechoice.com).*



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## Briefs

Entrust has been busy lately. The security firm is readying Entrust/PKI 5.0, a product upgrade with new policy management features. The company also has unveiled a technical alliance with Intel to offer public-key security across the Intel product line. And Entrust has introduced Entrust/Secure-Control (see story, page 40). This product adds Entrust PKI to Securant Technologies' Secure-Control security platform.

Entrust: (888) 690-2424

Web content management software provider **Interwoven** just picked up a cool \$19.2 million in additional financing. The money will fuel "market expansion and product development."

So far, the maker of TeamSite has raised nearly \$40 million.

Interwoven: (408) 530-5800

E-mail service provider **Critical Path** of San Francisco has agreed to acquire another messaging outsourcer, **dotOne Corp.** of Salt Lake City. Terms of the deal were not announced. DotOne provides 1,300 customers with a variety of add-on e-mail services that work with the likes of Lotus Notes, Microsoft Exchange and Novell GroupWise. Critical Path offers services to corporations, ISPs, Web-hosting companies and portals.

Critical Path: (415) 543-2800

**InstallShield** has agreed to build digital certificate technology from **CyberSource** into InstallShield's InstallFromTheWeb 3.0 software. This new InstallShield tool lets people download and install software from the Web with a single click. With CyberSource certificates, only those with authorization will be able to download the software.

## Marimba distributes documents

BY ROBIN SCHREIER  
HOHMAN

**MOUNTAIN VIEW, CALIF.** — Hot on the heels of its successful IPO, Marimba last week launched a new application that delivers and updates documents across the entire enterprise, without relying on e-mail, File Transfer Protocol (FTP) or paper.

Marimba's DocService also encrypts and compresses the documents, which can be sent across LANs, WANs, extranets and the Internet. DocService sits on top of Marimba's Castanet infrastructure, which is used to deliver software and data files.

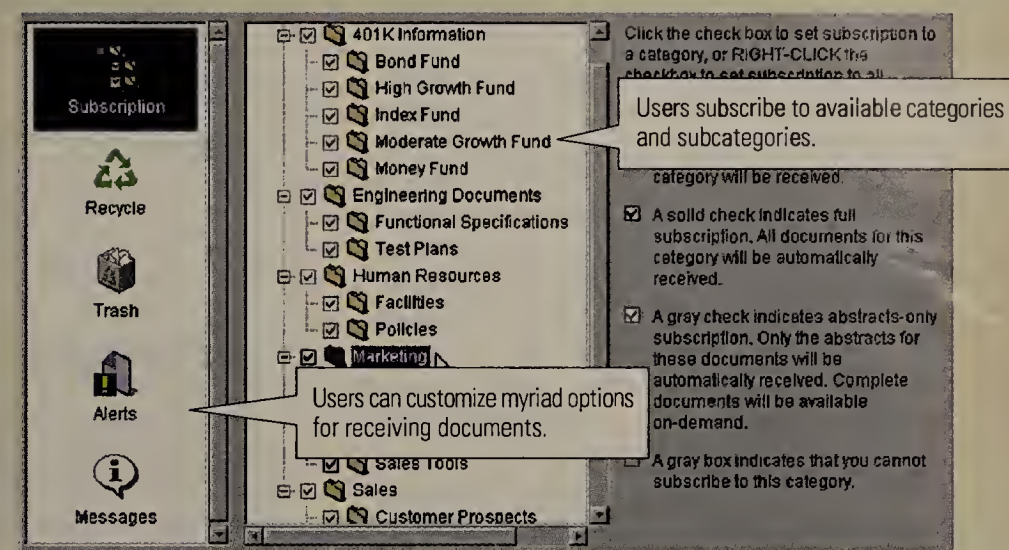
DocService is able to update documents that have already been delivered. If a document is opened while an update is received, Castanet keeps checking until the document is closed. This makes it ideal for keeping manuals, procedures and other key documents up-to-date.

DocService runs on a dedicated server that ties into a document database server. DocService can retrieve user information from any Lightweight Directory Access Protocol-enabled directory. It also works with Novell Directory Services and Windows NT domain services.

DocService offers a number of security features, including 128-bit Secure Sockets Layer encryption and client-side digital certificates. There's also an audit trail, to verify that all intended users have actually

## Publishing in the enterprise

Marimba's new DocService application helps you control the storage and delivery of any kind of document throughout your network, regardless of the user's location.



received the documents.

One beta tester at Nortel Networks says he has increased productivity and reduced errors by using DocService. Nortel in the past used FTP to deliver product information and specifications, and had mixed results.

"There wasn't any structured approach to delivering the documentation," says Umesh Gor, test engineering manager at Nortel in Santa Clara, Calif. Gor says documents would sometimes be sent two and

three times to the same person, or not at all. Now, he says, he's sure his manufacturer has what it needs, when it needs it, and he can prove it with the audit trail. Gor says he could see enterprise resource planning giants SAP and Baan jumping into this market as well.

"It gets them beyond their 'push' base. It is an easier and quicker sell than their new positioning as infrastructure for business-to-business," says International Data Corp. analyst Paul Mason.

DocService is shipping now — sort of. It's in "controlled availability," according to Marimba, meaning it's not yet in full production. DocService will be generally available in the third quarter. The company is offering an introductory price of \$1,000 per server through September.

The DocService server runs on Windows NT and Sun Solaris, and the client runs on Windows NT, 95 and 98.

Marimba: (650) 930-5282

## QUICKTAKE

## A new app for creating Java Server Pages

Elemental Software's Drumbeat 2000/JSP was announced last week at Sun's JavaOne conference. The application, which for now works only with IBM's WebSphere, is used to create Java Server Pages (JSP).

Like its sister product, which creates Microsoft Active Server Pages (ASP), Drumbeat 2000/JSP is targeted at Web developers who want to visually develop interactive forms and pages to access databases and applications. Drumbeat 2000/JSP also includes support for JavaBeans, which are reusable bits of Java code.

One beta tester says he likes JSP technology more than ASP technology because JSPs separate the HTML from the actual program logic. "You can't give an ASP file to an HTML developer because the HTML is scattered throughout, and there's a risk of accidentally modifying it," says Dave Hecksel, chief technology officer of Axtive Software, makers of e-Monogram personalization software, which is written entirely in Java.

Drumbeat 2000/JSP can be downloaded now from Elemental's Web site at [www.elementalsoftware.com](http://www.elementalsoftware.com) for \$249. The boxed version will ship in July for \$269.

Elemental Software: (877) 378-6232



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# BindView out to tame wild NT

BY JOHN FONTANA

In an effort to tame Windows NT as it spreads across the enterprise, BindView Development last week released a new version of its NOSAdmin for Windows NT.

Version 6.1 of the network management and security software focuses on performance, reporting and repairing breakdowns in a network's infrastructure.

Key to NOSAdmin's speed is BindView's ParaFlex, which allows queries to be processed on all NT domains simultaneously instead of one at a time. Performance, especially in enterprises with large numbers of domains, is up 10 to 20 times over previous versions of the software, claim BindView officials. To achieve those results, however, a ParaFlex query engine must be deployed in each NT domain.

Network administrators

have noticed the difference. "We run a lot of reports, being a financial company," says Sue Browning-Temple, LAN administrator for Inland Mortgage in Austin, Texas. "The speed in which we can complete those has changed dramatically."

What she wants now is a way to save those reports electronically, which BindView is working on for the next version of the software. Despite that shortcoming, there are important additions to the reporting features, Browning-Temple notes. "I can get information that previously was difficult to extract using NT's tools," she says. Particularly, she can run reports about individual users to discover resources available to them. BindView has added some 500 report templates that can be used out-of-the-box or customized.

The company has also beefed up security reporting with more than 600 security

## Task tamer

BindView last week released its NOSAdmin for Windows NT 6.1, the latest version of its systems management and security tool. The software includes ActiveAdmin, an engine for acting on data generated from reports.

Domain Name	User Name	Full Name	Logon Last Date/Time
Q-MASTER1	Arndt	Arndt, Arndt	None
Q-MASTER1	Bob	Bob, Bob	None
Q-MASTER1	Charles	Charles, Charles	None
Q-MASTER1	David	David, David	None
Q-MASTER1	Ed	Ed, Ed	None
Q-MASTER1	Frank	Frank, Frank	None
Q-MASTER1	George	George, George	None
Q-MASTER1	Henry	Henry, Henry	None
Q-MASTER1	Jeff	Jeff, Jeff	None
Q-MASTER1	Karl	Karl, Karl	None
Q-MASTER1	Larry	Larry, Larry	None
Q-MASTER1	Mike	Mike, Mike	None
Q-MASTER1	Paul	Paul, Paul	None
Q-MASTER1	Robert	Robert, Robert	None
Q-MASTER1	Sam	Sam, Sam	None
Q-MASTER1	Tom	Tom, Tom	None

With NOSAdmin, administrators can search for accounts that have been inactive and delete them in bulk.

checks on things such as user accounts, the Registry and the file system. The new version also includes effective permissions analysis, which details what directories users have permissions for and

how they have those permissions, be it through shared files, NT File System permission or group membership.

discover users with easily guessed passwords, the administrator can use ActiveAdmin to send each of those users an alert asking them to change their passwords.

"ParaFlex provides the engine to find the problems and ActiveAdmin delivers the fix," says Joe Bernick, product manager for NOSAdmin.

BindView is attempting to position the product between high-end management frameworks, such as IBM's Tivoli and Computer Associates's Unicenter, and single-function point products. The offering's main competitor is likely to be Axent's Enterprise Security Manager.

NOSAdmin for Windows NT plugs in to BindView's EMS framework, which includes services for NetWare and asset management. All the features can be run through a single management console.

Version 6.1 of NOSAdmin runs on NT 4.0 and the forthcoming Windows 2000 and is priced at \$695 per server. It is expected to ship this week.

BindView: (800) 813-5869

# Securant partners with PKI powerhouse

BY ROBIN SCHREIER HOHMAN

SAN FRANCISCO — A new PKI-enabled enterprise-to-Web security package from a small company already has one big

customer: security powerhouse Entrust.

Early last week, start-up Securant Technologies announced the ClearTrust suite of enterprise- and Web-based security applications. Later in

the week, the company got a boost when Entrust announced it would integrate Securant's first ClearTrust suite product, SecureControl Version 3.5, into its Entrust public-key infrastructure (PKI) product.

PKI is a system for authenticating users with certificates and other forms of digital verification, such as keys.

SecureControl Version 3.5 features a range of security tools, but doesn't offer a public-key component. Users can either buy SecureControl from Entrust with its version of PKI, or directly from Securant if they prefer to use another company's PKI product.

The ClearTrust suite is designed to be a scalable, rules-based and directory-enabled security platform. It aims to provide unified access management through the use of single sign-on, access control, authentication and authorization.

SecureControl, meanwhile, lets network managers set rules, test those rules and use PKI at the application level.

Putting PKI at that level makes it possible to administer both Web and network applications from one security console.

This summer, Securant expects to ship Secure Detector, the second product in the ClearTrust suite. Secure Detector will monitor unauthorized use of applications and send alerts when it detects suspicious activity.

## Securing an identity

The announcement of SecureControl Version 3.5 is a coming out of sorts for Securant. The product grew out of a custom security application the company developed for key financial players, including Wells Fargo, The Money Store and Lehman Brothers. This was when Securant was a consulting firm named Sirrus Internet Solutions.

By 1997, Sirrus executives saw the potential for an off-the-shelf application that could cover the new Web and legacy enterprise-based applications.

Sirrus changed its name to Securant Technologies last month and secured \$4 million in venture funding, although Eric Olden, Securant's chief technology officer, co-founder and president, declined to

name the backer.

Olden says one result of working with heavy-hitters and veteran electronic commerce sites such as Wells Fargo is that his developers learned early that the application had to be scalable. To prove that, the company develops against a database of 15 million users. That makes Securant confident SecureControl will be able to handle just about any Web site, Olden says.

Currently, SecureControl Version 3.5 uses the Oracle 7.3 database, and Version 4.0 will use Oracle8 or Sybase.

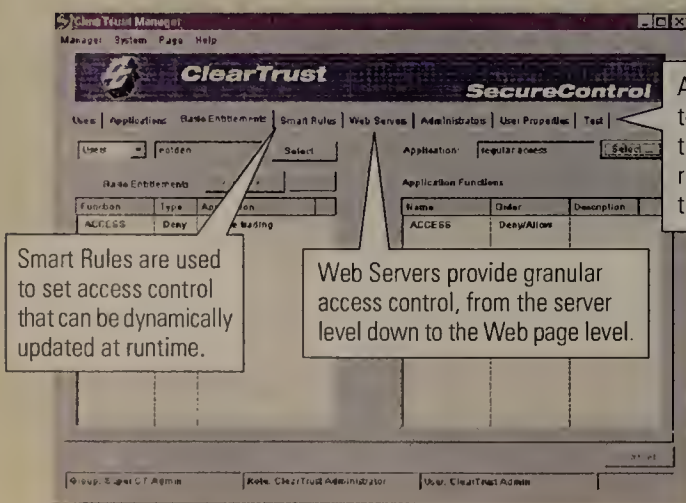
Another benefit of working closely with users while developing the software was that Securant's employees got to see firsthand how people actually use the product. What Securant found, Olden says, is that while security may be the most important task an administrator undertakes, "If it becomes onerous, it's unlikely to be done at all."

Securant is shipping SecureControl now. It costs \$20 per user, with a 1,000-user minimum, and \$5,000 for the database. The Entrust version will ship in the third quarter; pricing was not available.

Securant: (877) 732-8783

## Securing your e-business

Securant Technologies' new SecureControl, the first product in its ClearTrust suite, is aimed at securing electronic commerce sites by letting you set business rules by application. The security rules are held within the application and can be dynamically updated if a user meets criteria such as signing up for a premium service.



Administrators can test rules to see how the application will react when a user tries to access it.



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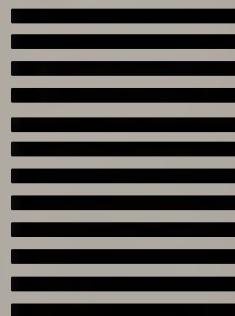
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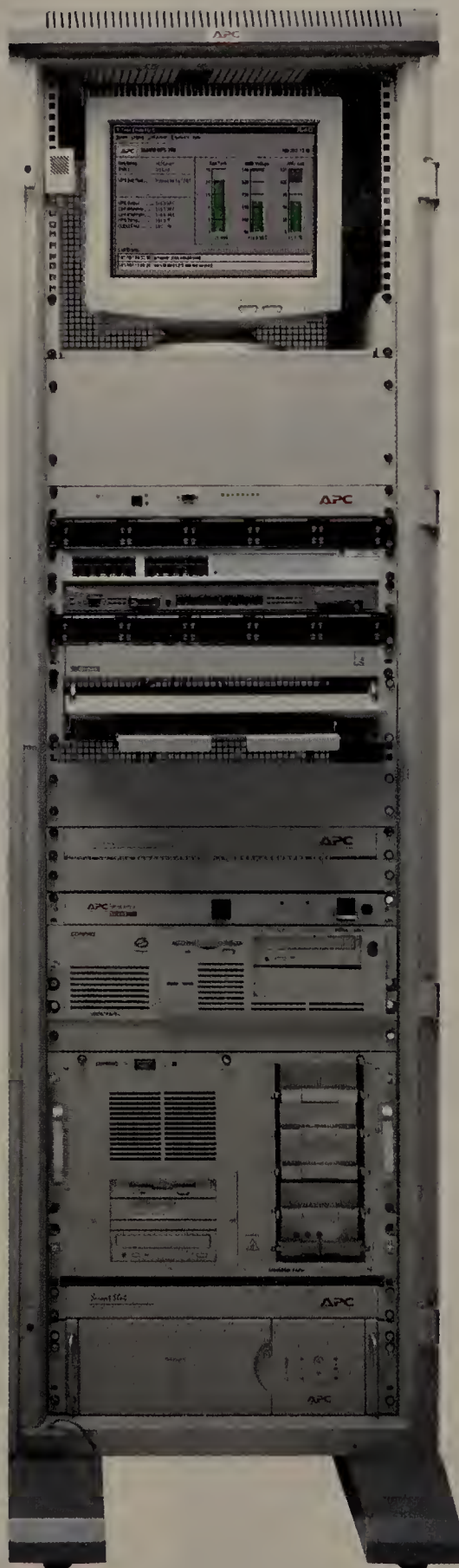
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# Internet postage gets U.S. stamp of approval

BY PAUL MCNAMARA

**SAN MATEO** — Buying postage over the Web will finally become an option for businesses nationwide later this summer, says Robert "Bo" Ewald, CEO of E-Stamp.

The U.S. Postal Service recently approved E-Stamp's third round of beta testing and, according to Ewald, is expected to grant final approval for full-scale online postage sales within a matter of months. About one thousand customers are testing E-Stamp with live postage purchases in California and the Washington, D.C., area.

While E-Stamp was first to begin beta tests in 1998, the company will face competition from another start-up, Stamps.com of Santa Monica, Calif., as well as from Pitney Bowes, which controls 85% of the mechanical postage meter market, and a French company called Neopost.

E-Stamp Internet Postage initially will

be targeted at small office and home office customers who have not made significant investments in postage meters, although Ewald sees potential for landing larger organizations.

The initial version will require customers to attach an E-Stamp "electronic vault" — a silver-dollar-sized disk — to the parallel port on the back of their PCs. Using E-Stamp software, postage is downloaded over the Internet to the vault, where it can be applied offline directly onto envelopes, labels and letters. Later this year, E-Stamp expects to offer a Web-only version that will require customers to be connected when they want to buy and apply postage.

E-Stamp will charge between 5% and 10% of whatever amount of postage a cus-

tomers purchases.

One E-Stamp beta tester, Fred Fournier of Fred Fournier Insurance Services in Novato, Calif., believes Internet postage has saved him hundreds of dollars since December by

reducing his trips to the post office to mail packages that weigh more than a pound. Postal authorities require that such packages be mailed in person as a security measure, Fournier says, but they exempt those marked by E-Stamp postage, which includes bar-code information that identifies the sender.

"If there's going to be a surcharge of 10% on the postage, I would gladly pay it," Fournier says.

While "really happy" with the overall performance of E-Stamp, Fournier had difficulties getting the software to work with an "early 1990s vintage" Hewlett-Packard LaserJet printer. "It's not a hard work-around, though," he adds. E-Stamp has promised a fix before the product ships.

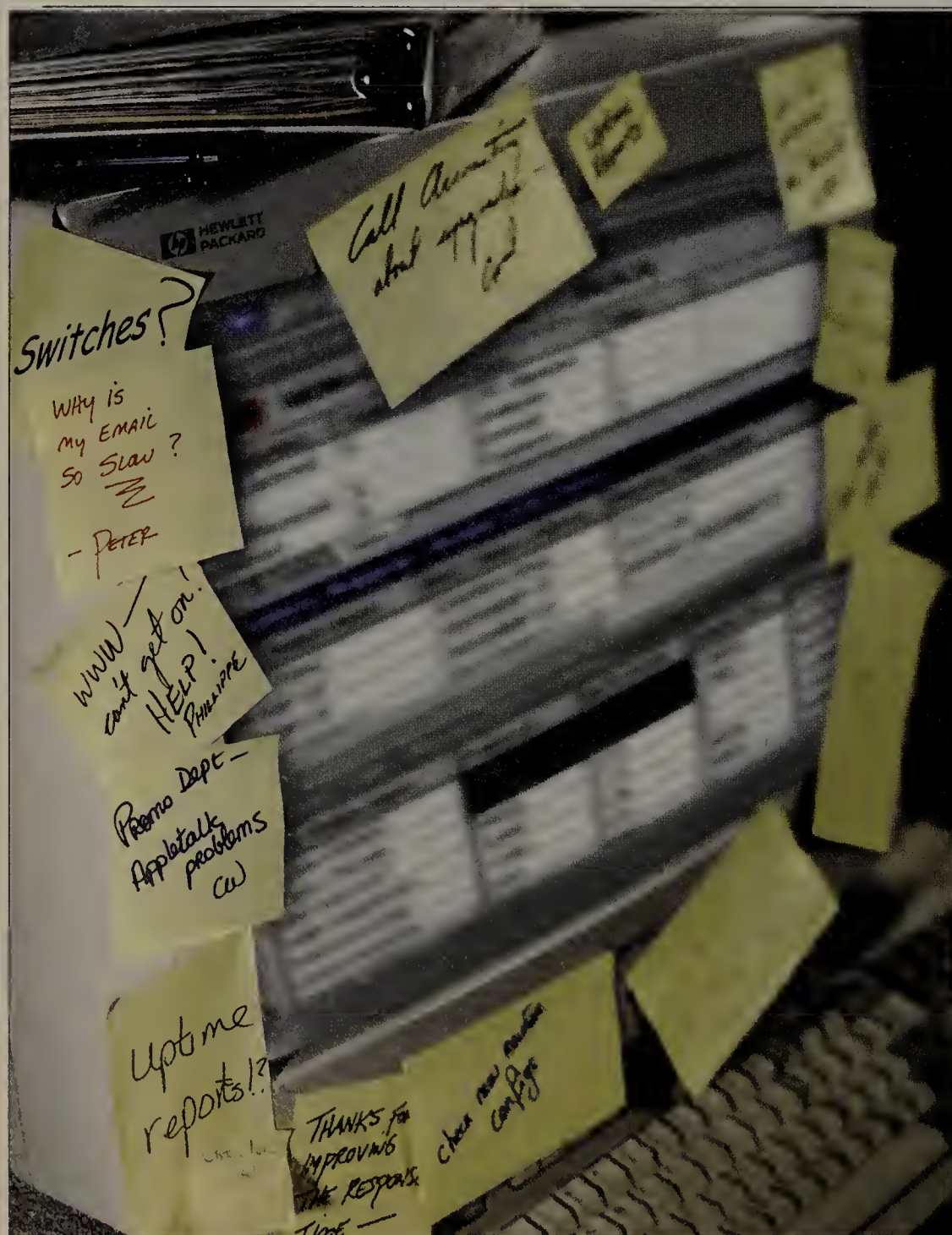
While Pitney Bowes is the only "name" company pushing Internet postage, Ewald remains confident that his start-up is positioned to compete.

"In brand-new markets like this, instead of the companies controlling the market, end customers are going to have more control over what happens because they'll have more choice," he says.

E-Stamp: (650) 554-8454

## PROFILE: E-STAMP

<b>Headquarters:</b>	San Mateo
<b>Founded:</b>	1997
<b>Products:</b>	E Stamp Internet Postage, offline and online versions
<b>Management:</b>	Robert "Bo" Ewald, president and CEO; John O'Dell, executive vice president, business development; Martin Pagel, chief technology officer
<b>Funding:</b>	\$16 million from Compaq, Microsoft, Francotyp Postalia AG & Co., AT&T Ventures and Canaan Partners
<b>Competitors:</b>	Pitney Bowes, Stamps.com, Neopost
<b>Web site:</b>	www.estamp.com



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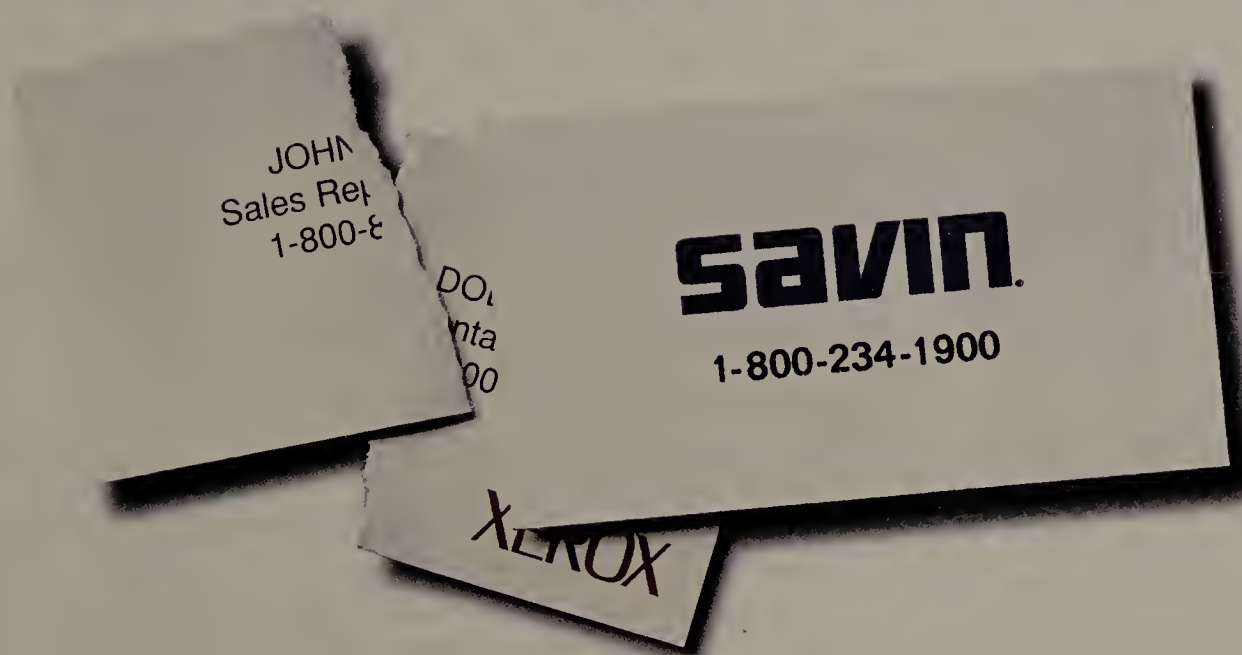


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## Enterprise Applications

# There's a new corporate portal coming to town

BY JASON MESERVE

Pleasanton, Calif.

KnowledgeTrack this week will release The Knowledge Center, a new corporate portal tool that lets end users post information on an intranet.

What makes The Knowledge Center unique is its integration with application servers, such as Microsoft Transaction Server, and those from SilverStream and NetDynamics. KnowledgeTrack's tool taps into the application server's underlying APIs to provide access to structured information — such as databases and enterprise

Porter says his company's product interfaces with SAP and PeopleSoft ERP systems at the underlying object level, making it easier for users to get at the data in those systems. The Knowledge Center can also access data stored in customer relationship management systems.

Users can set up personalized news, search and topic pages around their departments, customers or projects. The company, however, retains ultimate control over what users can see and can even push cer-

### Bringing corporate data together

The Knowledge Center corporate portal tool gives users access to both structured and unstructured information from a browser.



Search capabilities let users find data residing in flat files, ERP and groupware systems, such as Notes and Exchange.

Tool bar lets users access personalized search, news and other topical pages.

Companies can push pertinent information out to employees through the portal.

resource planning (ERP) data — and unstructured documents within an enterprise. For large implementations, the software can be clustered across multiple NT and Unix machines to handle the loads.

While KnowledgeTrack's competitors tend to use Active Server Pages and Common Gateway Interface scripting to generate Web pages on the fly, The Knowledge Center uses multiple objects running simultaneously on the back end to create HTML, officials claim.

"It basically uses a lot of up-to-date technology to help scale easily," says Guy Creese, a senior analyst with Aberdeen Group in Boston. "That's the big problem that most of the corporate portal vendors find. If they can't scale, they're dead."

But capacity is only one concern The Knowledge Center addresses. "Not only can it scale, but it can access all different types of repositories, as well," says Jack Porter, president and CEO of KnowledgeTrack in

tain pertinent information to the user population. Security is handled via integration with the Windows NT security model, meaning there must be at least one NT box in the implementation.

Users can publish their own documents to the portal using the Windows "Send to" command, which will automatically create and publish documents in the Adobe Portable Document Format (PDF). For remote users on slow connections, PDF files are "streamed" down to the browser, so users only have to download the page they want to see, rather than the whole PDF file.

Creese finds The Knowledge Center's ability to handle multiple data types attractive. "Users do not care what format their data is in; they just want to do a query and get all the information they need," Creese says. "In this respect, KnowledgeTrack is ahead."

Pricing for The Knowledge Center starts at \$25,000 for 50 users.

KnowledgeTrack: (925) 426-9688



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Net Insider . Scott Bradner

## IT'S NOT YOUR FATHER'S OLDSMOBILE

**A** ccording to a University of Texas study sponsored by Cisco, the Internet industry is now almost as big as the U.S. auto industry. The study shows

that the Internet industry generates \$301 billion per year in revenue, while the U.S. auto industry accounts for \$350 billion in revenue per year.

The Internet business is growing like crazy and has already reached a size at which its health is quite important to the overall U.S. economic

health. And all this without a commensurate impact on global warming.

The study (at [www.internetindicators.com](http://www.internetindicators.com)) contains many data points and factoids, including the assertion that there are seven new Internet users every second. In all, this is a study well worth reviewing. But I wonder what the study's findings mean for the 'Net — could the 'Net be too big to ignore?

Ever since the beginning, the Internet has had the good type of government help. Governments, including those from the U.S., Canada and other nations, have provided funds to support the basic research that has led to data-gram networks, the TCP/IP protocols, routing protocols and many of the basic Internet applications. Governments have also funded proof-of-concept networks, including the ARPANET and NSFnet. This support has been vital in getting us to where we are now in the Internet business.

But there is another type of government help that is not quite so helpful. ("I'm from the government, and I'm here to help.") I've already begun to hear from people in the U.S. government who want to help the Internet community understand the importance of the Internet. These people point out that with the convergence of the Internet and telephone networks, the Internet needs to be as reliable as the phone system has been. And, they point out, we all know it has been government oversight that has made the phone system so reliable and innovative.

I'm almost sad to see this report in spite of how well it proves the views of some of us that this Internet thing was going to be big — we were Internet before Internet was cool. But I'm afraid the report will attract too much attention, and we will get more government help than is healthy for the 'Net.

Government help usually comes with government regulations and reporting requirements. Generally, such regulations have been worked out in a political rather than a technical arena.

(Note: I would like to see some regulations, such as ones that protect privacy. I'm not blindly against all government intervention.)

On the other hand, there is an upside. This report will keep the venture capitalists throwing money at just about anyone who knows how to spell TCP/IP or Internet. Some of these new companies actually have some good stuff coming along — some of them even have something more concrete than the set of slides used to close their first round of venture funding.

Disclaimer: There is concrete at Harvard, but it's mostly hidden by brick. The above is my fear of help.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached at [sob@harvard.edu](mailto:sob@harvard.edu).*

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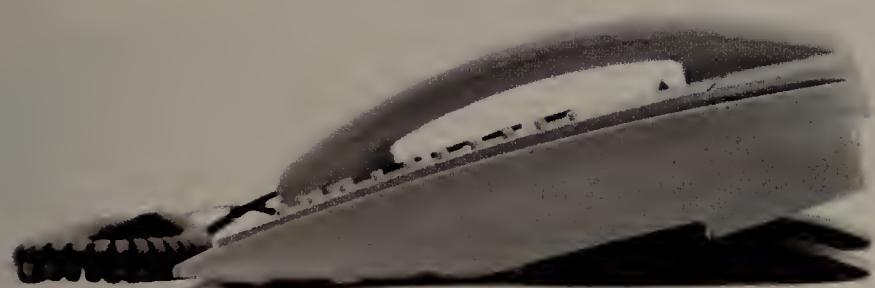
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It's also the most scalable ATM switch around – the AXD 301 is designed to scale from 10 Gbps to 160 Gbps. You can standardize all your switching needs on one system – from the massive core switch to the smallest node. With the AXD 301 you 'pay as you grow'.

And naturally it comes with complete ATM functionality, voice capability and a smart way to run IP traffic, making it ideal for the latest multi-service networks.

Which all goes to explain why, when large carriers pick up the phone to order large ATM networks, they're now calling Ericsson.



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# Technology Update

An Inside Look at the Technologies  
and Standards Shaping Your Network

## Ask Dr. Intranet

By Steve  
Blass

Our intranet connects two sites, with a LAN at each. One site has an Internet connection via a digital leased line, and

each site has a Cisco router. The line between the sites is an analog leased line, with modems on each side. What is the best way to link the networks so they act as one network for file and print sharing? I also have a program that must be run over the network, and the people on the side without the Internet connection need to have access to the 'Net via the leased line.

Via the Internet

You need to configure the routers to provide logical connectivity. For TCP/IP connectivity, the router not connected to the 'Net needs a default route pointing to the router linked to the 'Net. The 'Net-connected router needs a route directing traffic with IP addresses on the remote LAN back through the modem and a default route pointing to the 'Net for other traffic. You can establish these using the "IP route ..." command from the command line or by running a routing protocol that lets the routers learn routing information from each other. For Windows networking, you may need to enable "broadcast helper" addresses in the routers to propagate Windows broadcast traffic between the LANs. Configuration instructions for Cisco routers are on the documentation CD that came with the routers, and at [www.cisco.com](http://www.cisco.com).

As a network architect at Sprint Paranet in Houston, Blass understands the strain of developing and managing intranets. Send your problems to [drintranet@paranet.com](mailto:drintranet@paranet.com).

## Mapping Ethernet CoS to ATM QoS

BY TIM HALE  
AND CAM CULLEN

Thanks to maturing standards such as 802.1p and IP Type of Service (ToS), the task of setting class-of-service (CoS) priorities for LAN applications is getting easier. But when traffic from these applications hits an ATM network, whether it be a LAN backbone, WAN or metropolitan-area net, network

The IPToS specification works in a similar way but is implemented at Layer 3. IP ToS also sets aside three bits, in a precedence subfield located within the IP header. But unlike 802.1p, IPToS requires Layer 3 intelligence to be recognized by net devices. Also unlike 802.1p, IP ToS priorities can be preserved over routed WANs. Fortunately, many switches now can map 802.1p to IPToS in order to preserve CoS priorities beyond the LAN.

parameters, the switch then consults a mapping table with settings that have been predefined through the policy controls of network management software.

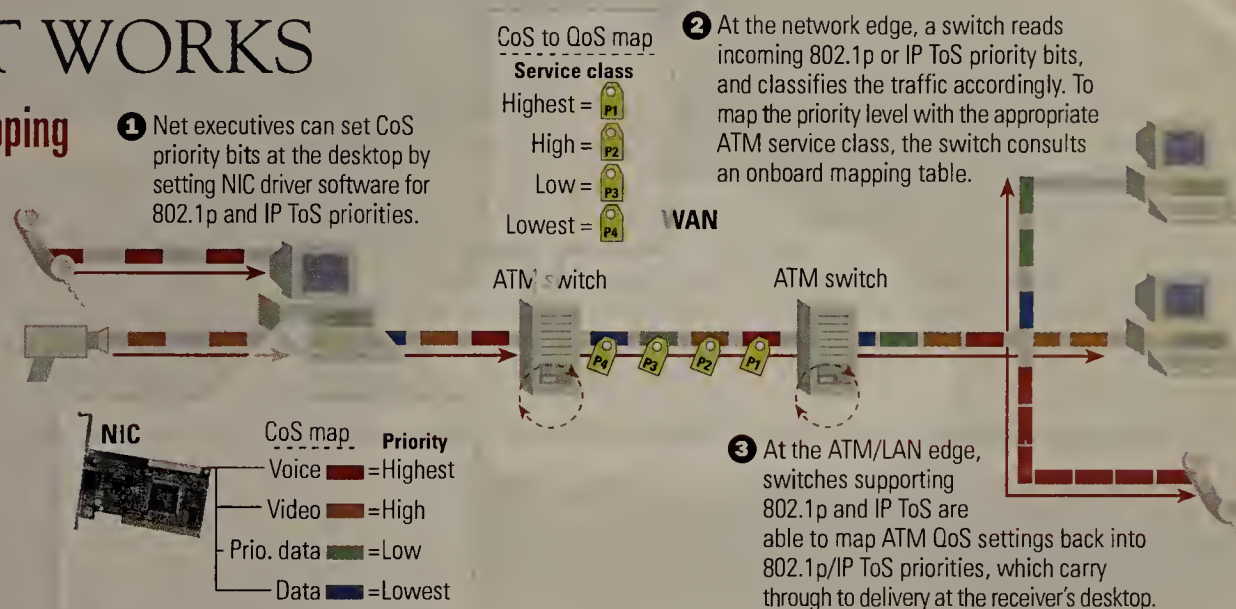
ATM service classes range from highest priority constant bit rate down through real-time and non-real-time variable bit rate and on to available bit rate and unspecified bit rate.

Once the mapping is complete, the call is put through over an ATM virtual circuit.

### HOW IT WORKS

#### CoS-to-QoS mapping

Newer switches can use 802.1p and IP ToS information to map CoS to ATM's QoS and ensure important traffic gets priority as it is being delivered across the WAN.



managers need to be able to map those CoS settings to the quality-of-service (QoS) features inherent in ATM signaling.

The ATM Forum is working to standardize the mapping process, but it will be a while before a formal standard is released. In the meantime, net managers can make use of the mapping features now becoming available in priority-enabled Ethernet/ATM switches and routers.

The ability to set CoS priorities for Ethernet LAN traffic is becoming more important every day. Voice, video and other applications demand higher network priority than do applications that are less latency-sensitive or bandwidth-hungry. But other applications, such as end-of-quarter financial reports or even network-control data, also require priority over normal day-to-day traffic.

The IEEE's 802.1p and the IETF's IPToS standards represent powerful tools for network managers setting CoS priorities.

The 802.1p specification calls for three priority bits in the Ethernet frame header. These bits can be set for any of eight priorities, and then read by LAN switches at Layer 2.

With either CoS type, priorities may be set at the user desktop, according to corporate policy, through application or other intelligent software; or priorities may be set at switches in the LAN. Higher-priority applications will then get favored treatment in switch output queues.

802.1p and IP ToS technology can set only relative priorities because the connectionless nature of LAN packets rules out the kind of absolute guarantees that a true end-to-end circuit would provide. At the ATM edge, however, absolute guarantees are possible due to the connection-oriented nature of ATM.

With CoS-to-QoS mapping, net executives can extend the benefits of ATM QoS into their Ethernet LANs, and will effectively guarantee Ethernet priorities across the ATM backbone. This is why CoS-to-QoS mapping capabilities are showing up in increasing numbers of priority-enabled Layer 2 and Layer 3 switches and routers with ATM interfaces. Such a switch or router reads incoming 802.1p or IP ToS priority bits, and classifies traffic accordingly. To match the priority level with the appropriate ATM service class and other

During the call, ATM switches maintain the preset QoS parameters. At the destination, the call can be remapped by the receiving ATM-enabled edge switch. If that switch is also 802.1p/IP ToS aware, the device will be able to carry on with CoS priorities through to the receiver's desktop.

Currently, the ATM virtual circuit likely to be used for CoS-to-QoS mapping is a permanent virtual circuit. PVCs must be manually configured, with the network administrator reserving the necessary bandwidth for each call, and the PVCs remain open until they are manually torn down. They are best used for predictable, long-duration traffic flows.

In the future, users will take advantage of the other type of ATM connection, the switched virtual circuit. SVCs are more flexible than PVCs because they are set up and torn down dynamically, as needed.

Hale is senior product marketing manager and Cullen is senior technical marketing manager for 3Com's Network Systems Division. They can be reached at [Tim\\_Hale@3Com.com](mailto:Tim_Hale@3Com.com) and [Cam\\_Cullen@3Com.com](mailto:Cam_Cullen@3Com.com).



Headline — inside the network machine . Mark Gibbs

## REVISITING THE REMARKABLY RESILIENT PING UTILITY

One of the most basic tools in the IP tool kit is the packet Internet groper, or ping, utility. All ping does is bounce packets off another machine running TCP/IP and measure the time it takes the packets to get there and back.

Doesn't sound like much, but it's a tool you absolutely must have. The reason is that ping is available on just about every platform that supports TCP/IP and answers two questions: Do I have a connection, and is that connection any good?

Ping is based on a core protocol of the TCP/IP suite, the Internet Control Message Protocol (ICMP). The purpose of ICMP is to let a receiving computer or an intermediate gateway device inform the computer that originated an IP packet that it must take corrective action.

For example, if the packet was corrupted in transit, the ICMP message would request a retry. Or if the destination was unreachable, a gateway would use ICMP to inform the sender to try something else.

To see where ICMP fits in, let's take a second to review the TCP/IP architecture. At the lowest level is



the network layer, roughly equivalent to the physical and data link layers of the good old Open Systems Interconnection model. This is where the standards for network transports, notably Ethernet, live.

The next TCP/IP layer on the stack is the Internet layer, equivalent to OSI's network layer, which encompasses the Internet Protocol. On top of that sits the transport layer, which equates to the OSI layer of the same name and is the domain of TCP.

Finally, we have TCP/IP's application layer, which encompasses the final three layers of the OSI model.

Now, back to ICMP. ICMP datagrams are encapsulated in IP packets, so the protocol should logically be

part of the transport layer. But as ICMP actually modifies the behavior of the IP layer, it is functionally an IP protocol.

ICMP has many functions. Central to our interest is the ICMP echo request. Support for the echo request is a basic design element of TCP/IP stacks. Upon receipt of an ICMP echo request, TCP/IP responds by immediately sending an identical packet back to the sender.

The length of a ping datagram is variable from one to 1,472 bytes. This leads to an interesting hack: Have you ever wondered how people come up with the statistics of which machines are running what operating systems on the Internet?

The answer is that they send out malformed ping requests of various lengths. Because each TCP/IP stack handles the error reply differently (there's no defined standard), each implementation has a different response.

But what's really useful about ping is you can not only find out if another computer is online, but you can also determine how far away it is. This relies on another simple

technique: When a ping request is sent, the payload includes a time stamp of when the packet was transmitted.

If the remote machine responds, the time stamp in the returned packet is compared to the current time to determine how long it took for the packet to get there and back. That value is then halved, and that gives the average time required for a packet to travel from one computer to the other.

In large TCP/IP networks, ping gives valuable insight into how the system is performing. For example, as routers drop out, packets may change their routing and therefore transit time may increase (or, rarely, decrease).

Packets may also be lost. Large, heavily trafficked routers do, in fact, drop packets because TCP/IP has the ability to resend lost packets. And when you run a ping utility, what you will get in addition to the transit time will be a count of dropped packets.

*Next week, ping software. Packets to [gh@gibbs.com](mailto:gh@gibbs.com).*

## NetworkWorld Fusion Spotlight

News, tips and tools from our Web site

### A W2K problem

No, that's not a typo. A Fusion reader who is beta-testing Windows 2000 Server (he has Beta 3) is running into problems with the network interface card built into his ProLiant 1600 server — such as, oh, the server bringing down the entire network. Not a good thing, obviously. He's also having some problems with Active Directory and is looking for suggestions on both fronts. We wonder what

other users' experiences have been with the beta of Microsoft's next-generation operating system.

*DocFinder: 3429*

### Nutter's Help Desk

A few weeks back, Ron Nutter helped a reader who was experiencing slowdowns with Outlook clients running through his remote-access server. This week, Ron answers the query of another reader with a similar problem, involving Outlook Express

clients using Post Office Protocol 3 on an NT server and a Brooktrout modem. And you'll find an archive of Nutter's columns online.

*DocFinder: 3428*

### At the stroke of midnight

Last week, we asked what you and your staff were going to be doing at midnight on Dec. 31, 1999. We heard from one user who said his department has canceled all vacations between Dec. 23 and Jan. 8, and another who said he'll be at his console "awaiting the plague." But we also heard from one person who writes (with a touch of smugness, we think): "I'll be doing whatever seems the most fun and not worrying about the network, as it is composed entirely of Macintoshes." What about you? Strapped to your desk or party animal come the millennium (or is that the almost-millennium)?

*DocFinder: 3340*

### Digital subscriber line

Some readers reacted to last week's story about interoperability issues related to DSL services and equipment. One blamed the phone companies: "They whine about not having cable access and about local calls being longer, but they just won't invest in DSL." What do you think?

*DocFinder: 3430*

### Free software

Network World Senior Editor Jeff Caruso has written a series of stories on free — but useful — software for the network professional. We've bundled the articles onto a single "Essential Tools" page, from which you can download them.

*DocFinder: 3431*

### Opinions

Network World and Network World Fusion have some of the best columnists in the business. Now you can find

them on a single page. Our Columnists page lists every column in print and online for that week, with an excerpt (so you can decide whether to click on them). Plus, we've kept the links to the columnists' previous columns.

*DocFinder: 3432*

### Career Doctor

Shaun Kelly is online this Wednesday to help tackle career issues. Hit him with your questions, and read his thoughts on career moves.

*DocFinder: 2729*

## Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. *DocFinder: 2450*

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## Editorial Insights

### A challenge to the champions of convergence

Quiz time: Is convergence inevitable in the LAN and the WAN?

A: Yes for both.

B: Yes for the WAN; no for the LAN.

C: Yes for the LAN; no for the WAN.

D: No for both.

E: Define convergence, and explain what's in it for me.

If you're like me, you chose E. (Unless, of course, you added your own "F: Leave me alone." Perfectly reasonable.) I've heard telecommunications equipment providers talking about convergence in the WAN and datacom vendors talking about convergence in the LAN. I've heard about "everything over IP," as well as convergence over ATM and frame relay.

I'm still not clear on which customers really need a converged LAN and why; whether the service providers' networks will converge on a single protocol or infrastructure; and whether customers should care, as long as they are getting reasonably priced, flexible services.

But rather than whine, I'm doing something about it. I'm staging a Convergence Showdown at NetWorld+Interop in Atlanta in September, and I'm going to be challenging the leading generators of this convergence hype to stand up and explain what convergence is and what's in it for *Network World* readers.

By now, you're probably familiar with our showdowns. They are presidential-style debates in which the vendors' top technical executives field questions from a panel of experts, each other and the audience. We've done showdowns on switching, network/systems management, thin clients and, at the most recent N+I, network operating systems.

But I need some help here. Who should I challenge? I'm leaning toward a panel (no more than six vendors) comprising the telecom and datacom equipment vendors — companies such as Cisco, Nortel Networks, Lucent and 3Com. They've all been promoting visions of convergence that play to their own strengths in one discipline and undermine their rivals' positions.

But what about carriers? What about the likes of Sprint, MCI WorldCom and AT&T? Is there anyone else?

Drop me an e-mail with your answer to the question up top and thoughts about convergence, along with your rationale. And let me know who you want me to challenge and why.

— John Gallant  
jgallant@nww.com

## Message Queue

### DIFFERING VIEWS ON ANTIVIRUS UPDATING

I was stunned by Winn Schwartau's tirade about antivirus vendors ("Antivirus companies should stay on top of their products," May 31, page 45).

My firm uses a different product, so I have no particular reason to defend Network Associates.

But after reading Schwartau's column, I went to the company's Web site ([www.nai.com](http://www.nai.com)) to see what I could find out. Prominent on the first page is a button labeled "Antivirus Updates." Clicking on this button takes you to a page that tells you, among other things, how to update antivirus DAT files.

I also went to the "Buy" page and selected VirusScan. The "More Info" button is right next to the "Add to Cart" button and seems a natural selection for someone wanting to purchase software. "More Info" discusses the software's ability to push updates to the desktop.

I do not buy in to the attitude that the world should pander to the lowest common denominator, and that I should pay considerably more for software to be rewritten every week.

I've bought more than a dozen new cars in my life, but not one dealer told me I'd have to buy fuel. So if I run out of gas, should they give me a full refund?

Readers would have been far better served by an article pointing out the need for end users to take responsibility for keeping their antivirus software current rather than Schwartau's "let's dumb down" rhetoric.

John Wilson  
IS manager  
Clark, Richardson & Biskup  
Kansas City, Mo.

*Schwartau replies: I believe that for mass-market software, which has become something of a commodity, we do indeed have to cater to a lower common denominator than we do now.*

Send letters to [nwnews@nww.com](mailto:nwnews@nww.com) or John Gallant, editorial director, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

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People in general look for the easy way out and tend to make rash assumptions: "I just bought antivirus software, so I am safe from viruses now and for evermore."

Shouldn't the consumer be able to have confidence that the product he is buying from the Web is current and not half a year old?

If you had bought your first car in 1906, you might well have been told you needed to add fuel.

First-time boat owners need to be taught how to mix gas and oil properly. First-time computer owners need to know a whole beek of a lot more than that.

Face it, the learning curve is steep and can be treacherous. Many "trained" corporate workers do not know what a signature file is, much less that it needs to be updated regularly.

Vendors that regularly update their software should keep the online "for sale" version updated. Yes, customers can update the signature files themselves. But why shouldn't the vendors do it for the benefit of their customers?

I completely agree with Winn Schwartau's view on Network Associates' VirusScan product. I can understand why a shelf copy of an ever-changing product such as antivirus software might ship out of date, but for a vendor to sell a downloadable version that's already seven months old is completely unacceptable.

What's worse, there is no intuitive way for a new user to know that his computer isn't being protected from the latest virus. Why isn't there a button or link right on the front screen of VirusScan that checks if the signature file is out of date?

My company purchased hundreds of versions of this product. We spent countless hours trying to devise a way to safely and effectively keep everybody up to date.

Finally, we had to come up with a hybrid version of a third-party package and our own home-grown software.

Mike Steadman  
Harrisonburg, Va.













## IN CYBERSPACE, THERE'S NO RIGHT TO PRIVACY

**M**any people say the privacy of 'Net surfers is threatened by the information-gathering capabilities of Web sites. Some advocate privacy laws that would limit the information Web sites can collect, restrict the sale or trading of such information and require that every Web site publish its privacy policy.

These demands are unnecessary and unfair. Internet privacy laws, if enacted, might actually lead to greater intrusion into private matters.

Privacy is not, nor has it ever been, considered a basic human right. The word "privacy" does not even appear in the U.S. Constitution, nor in its amendments. The word "private" is mentioned only in connection with the right to be secure from illegal seizure of property (see [www.usconstitution.net](http://www.usconstitution.net)).

Until 1985, the Supreme Court treated protection of privacy as sometimes necessary for the protection of more established rights. In essence, the court recognized government intrusion as a unique threat because it could be used to prevent or discourage the free exercise of fundamental rights. Thus, we should

be less concerned about privately owned Web sites collecting information about users and more concerned about government surveillance of users and site owners alike.

There is another important distinction to keep in mind. The Declaration of Independence proclaims that the "pursuit of happiness" is an unalienable right. But our founding fathers carefully avoided saying that government must ensure our happiness. Similarly, we have the right to seek privacy, but there can be no guarantee we will find it. Thus, users have the right to boycott Web sites that do not meet their personal privacy standards, but they do not have the right to force Web sites to comply with those standards.

Telling Web site owners that they must not observe or record your actions is not protecting your rights, it is trampling on theirs. It is like walking into a retail store with a sign on your forehead, but insisting that no one be permitted to read or remember what the sign says.



Just how much information is revealed when you visit Web sites, anyway? Web sites can determine the URL of the site you clicked through from, what operating system and software you are running and your IP address (which changes for dial-up users). Web sites can't learn your name, e-mail address or credit card number — unless you specifically give them that information.

Some people worry that the Internet will make it easier for vendors to collect data on consumers. But vendors have been using information technology for decades. What has changed is that now vendors can personalize the information they present to individual consumers, and consumers can scour the globe for the best products at the best prices. Internet privacy laws can only hinder the free flow of information that has helped make the 'Net the huge success it is today.

*Brodsky is president of Datacomm Research Co., a consultancy in Chesterfield, Mo. He can be reached at [ibrodsky@datacommresearch.com](mailto:ibrodsky@datacommresearch.com).*

## NT CLUSTERING STILL BEDEVILS MICROSOFT

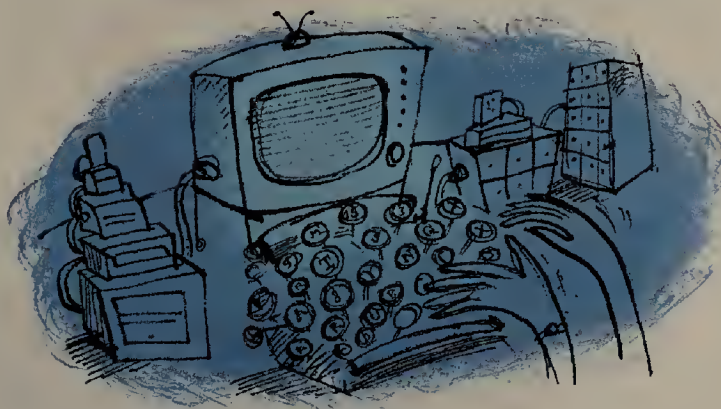
**W**hen it comes to NT clustering, Microsoft is almost a decade late and many dollars short. Why? While several pundits have suggested technical reasons, it could be more of a cultural issue for the company. Microsoft doesn't think the same way about servers as you and I.

A cluster is a collection of servers or individual hard disks that can act as a single entity to improve reliability and availability. When one component fails, applications continue working without interruption on the remaining servers or disks.

But while clustering may be a simple concept to explain, it is devilishly difficult to implement. You have to design your operating system to know how to take over for a failed machine while keeping user sessions active. You need to understand how applications, such as databases, Web and other network services, use your server's memory and disk resources, and how the operating system handles user logons and other network resources.

The ideal cluster has three or more linked servers. Odds are low that the critical components in all these servers would fail at the same moment.

Microsoft still is far behind the curve on what many Unix vendors, including Sun, Hewlett-Packard, Compaq/Tandem and NCR, have been delivering for close to a decade. For example, Sun's Solaris Cluster can support up to 256 nodes, and other Unix vendors have been delivering clustered systems for many years. Currently, NT can support only a meager two-node cluster, although Microsoft has unrealized plans to move beyond that. Two-node systems really don't do the job and aren't the true insurance policy that three-node or higher systems offer.



Microsoft employs a large number of people to write and design operating systems. NT has been out for many years, and the promises of true clustering have been touted for almost as long. So why is it taking Microsoft so long to get NT clustering right? I think it comes down to corporate culture.

In its Redmond, Wash., headquarters, one of the nice things that Microsoft has done (taken from Apple, if you really want to give credit) is enable every desktop to become a peer server at a moment's notice, with just a few mouse clicks. Given that servers come and go on the corporate network, it's hard for anyone at Microsoft to take them seriously. That fact makes it culturally harder to develop solid clustering because anyone can mount a hard disk from across campus.

Most corporations aren't eager to use peer servers to run their mission-critical applications. They want dependable, consistent machines that sit on raised floors, with backup power and backup tapes spinning nearby. Clustered servers are the next extension of this mainframe mentality — they make important applications, such as your corporate Web

site and various databases, almost impervious to downtime.

There is hope for NT and, interestingly, it comes from IBM. IBM is working on not one, but two clustering technologies — one public and another that has been kept mostly under wraps in IBM labs.

IBM introduced the public technology, called Cornhusker, last month. It can handle a cluster of up to eight NT servers. Basically, IBM has written extensions to the operating system to handle the switching among failed systems.

In my role as a consultant, last month I also got a chance to see some new IBM technology that turns the concept of clustered servers on its ear: a high-reliability, very high-performance — yet low-cost — network for distributing PCs. Here the switching among computers is accomplished in silicon, inside a series of chips that are placed on a PCI card. The technology I saw was running on NT, although it could easily (at least according to my sources at IBM) be developed for other operating systems, including Linux. Too bad the technology is still behind the closed doors of IBM's labs because this is exactly the kind of product corporations have been waiting for: inexpensive, highly reliable PCs.

It's a shame that it has taken NT so long to catch up with the Unix world when it comes to clustering. But maybe IBM's efforts can help Microsoft get over its cultural blind spot and turn NT into a true mission-critical operating system.

*Strom writes frequently on network topics and publishes his Web Informant essays at [www.strom.com](http://www.strom.com). He can be reached at (516) 944-3407 or [david@strom.com](mailto:david@strom.com).*



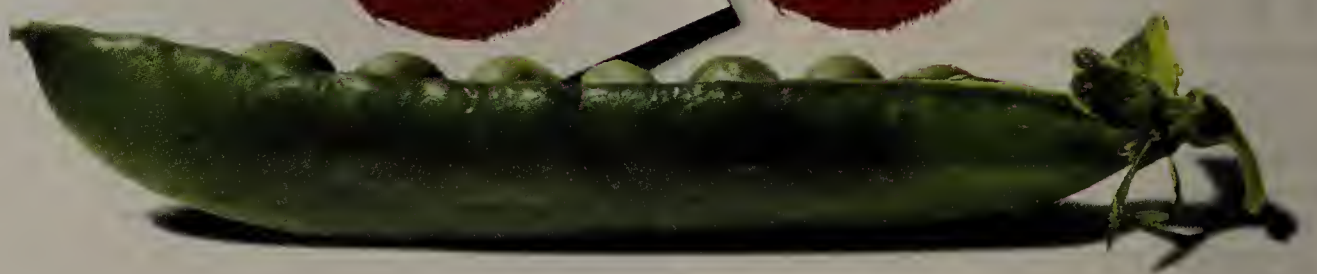
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# CIM CREEPS EVER CLOSER

Continued from page 1

Wood is eager to beta-test the service-level management capabilities in Manage.Com's FrontLine e.M. Slated for release next month, the product is said to automatically discover, locate, diagnose and correct problems such as electronic commerce transaction bottlenecks.

What makes all this possible is the Common Information Model (CIM), a key part of the Desktop Management Task Force's Web-based Enterprise Management (WBEM) blueprint for unified administration. CIM is a set of schemas for describing and sharing enterprisewide management information. In addition to CIM, WBEM includes these elements:

- XML, a standardized structure for presenting and structuring management information in Web page format. XML will let management applications dynamically share CIM data.
- HTTP for common transport of management information.
- Lightweight Directory Access Protocol, which defines a directory infrastructure for storing and accessing management information.

DMTF working groups are in the process of evolving a set of CIM schemas that describe the gamut of managed elements: servers and desktops, including operating systems, components, peripherals and applications; all layers of the network, from Ethernet switches through IP and HTTP connections; and users. Schema fields describe the attributes that apply to these objects, from the type of printer or storage medium used, to RAM and CPU capacity, to whether a switch supports

the Border Gateway Protocol. CIM will also define management functions and disciplines, such as application performance measurement and policy-based networking.

One of CIM's major strengths is a hierarchical, object-oriented architecture that makes it comparatively straightforward to track and depict the often-complex interdependencies and associations among different managed objects. Such interdependencies may include those between logical network connections and underlying physical devices, or those of an e-commerce transaction and the Web and database servers on which it depends.

CIM schemas are also far more comprehensive than SNMP or the Desktop Management Interface (DMI), says John McConnell, president of McConnell Consulting in Boulder, Colo. This will hopefully minimize the sort of product-specific extensions that are eventually included in essentially proprietary SNMP Management Information Bases. "I think CIM and XML are the best shot we've had in the management realm for a long time," McConnell says.

A small but growing band of CIM-savvy users is also excited about the implications of having a common, vendor-independent language for managing increasingly multivendor systems across the enterprise.

Companies such as United Parcel Services, for example, see CIM as their best crack at that elusive, long-pursued animal — the vendor-independent management information repository.

Right now, like most companies, UPS maintains multiple, vendor-specific and often redundant sets of management information, each generated by a different management application or tool.

Ensuring that changes, such as user updates or device reconfigurations, get propagated in all the right places is an administrative nightmare, says Peter Gunn, network performance manager at the package handler in Mahwah, N.J.

UPS' management framework, Tivoli NetView, provides a common repository that applications can share — provided they support the framework's APIs. Gunn hopes that a CIM-based repository will give him a broader choice of management applications without sacrificing information-sharing.

Also generating user interest in

Guy Wood, CIO of Internet Banking Communications, is anxious to use the CIM-enabled Manage.Com FrontLine e.M. management application to diagnose and fix network bottleneck.



CIM is the Directory Enabled Network (DEN) standard, which defines how managed network, system, user and policy objects can be stored, associated and accessed in a common directory infrastructure. The DEN standard was folded into WBEM last fall.

MCI WorldCom sees CIM as crucial to its DEN strategy. "In a directory-enabled world, we don't have to know what type of system it is or the physical location of it to get information," says Glenn Tindall, internal enterprise data networking group director at the Washington, D.C., carrier.

CIM and WBEM's vendor-independent infrastructure will help MCI WorldCom's IT staff deal with a slew of incompatible systems that the company has been left with as a result of multiple mergers. For that reason, the network services giant is calling for WBEM support in its management-related requests for proposal. However, Tindall says his firm will have to prototype CIM because so many schemas are still incomplete.

Indeed, until very recently, CIM was more prototype than actual reality.

Manage.Com, for example, had to write its own home-grown schemas as place holders for CIM models that the DMTF has not yet defined. And with few vendors supporting CIM, Manage.Com also had to provide its own CIM agents — software to convert existing SNMP or Desktop Management Interface (DMI) information to CIM — on key e-commerce servers.

While a truly impressive roster of vendors has worked on the standard and promised to support it, only a handful have shipped CIM-compatible products. Of the available products, most are designed to manage Windows and Windows NT desktops.

This isn't surprising because systems management has by far the most fully defined set of CIM schemas, and Microsoft is CIM's original instigator.

## CIM product parade

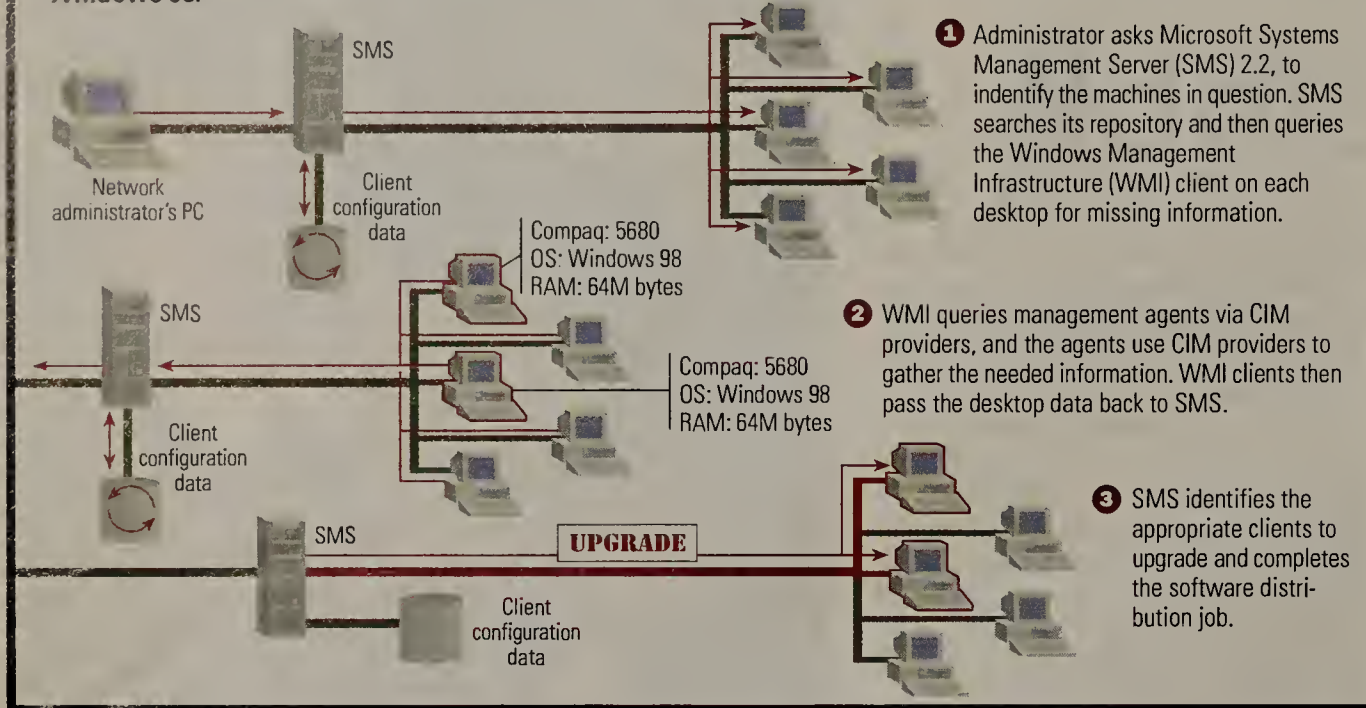
Here's a sampling of products that support CIM:

<b>3Com</b>	<ul style="list-style-type: none"> <li>• Adapters (scheduled for release this quarter)</li> <li>• Transcend (scheduled for release later this year)</li> </ul>
<b>BMC</b>	<ul style="list-style-type: none"> <li>• Patrol 3.3</li> </ul>
<b>Cisco</b>	<ul style="list-style-type: none"> <li>• CiscoWorks 2000</li> </ul>
<b>Compaq</b>	<ul style="list-style-type: none"> <li>• Insight Manager XE</li> <li>• Management agents (scheduled for release by year-end)</li> </ul>
<b>Computer Associates</b>	<ul style="list-style-type: none"> <li>• Unicenter TNG 2.2 (scheduled for release later this year)</li> </ul>
<b>Hewlett-Packard</b>	<ul style="list-style-type: none"> <li>• OpenView Network Node Manager</li> </ul>
<b>Manage.Com</b>	<ul style="list-style-type: none"> <li>• FrontLine Manager</li> <li>• FrontLine e.M</li> </ul>
<b>Microsoft</b>	<ul style="list-style-type: none"> <li>• Registry</li> <li>• System Management Server 2.0</li> <li>• Windows Management Infrastructure</li> </ul>
<b>NetIQ</b>	<ul style="list-style-type: none"> <li>• AppManager Suite</li> </ul>
<b>Nortel Networks</b>	<ul style="list-style-type: none"> <li>• Optivity Policy Services (scheduled for release this quarter)</li> </ul>
<b>Sun</b>	<ul style="list-style-type: none"> <li>• Solaris WBEM services (scheduled for release next year)</li> </ul>
<b>Tivoli</b>	<ul style="list-style-type: none"> <li>• IT Director 2.1 (scheduled for release in August)</li> <li>• Tivoli NetView</li> </ul>



## CIM at work

This diagram shows how CIM-based desktop systems aid software distribution. The network manager's job is to find and distribute software to Compaq Presario 5680s with at least 64M bytes of RAM and running Windows 98.



CIM is now shipping with Microsoft's Win32 Registry, which tracks and reports software assets on Windows and NT systems, and with Microsoft's Systems Management Server (SMS) 2.0.

More important, Microsoft is so far the only systems vendor to ship a CIM object manager (CIMOM).

CIMOMs are keystones of the CIM architecture, acting as liaisons between management applications that request information and the various agents managing different elements of that system.

Microsoft's CIMOM, the Windows Management Infrastructure (WMI), is included in Windows 98 and in the service pack for NT 4.0; it will also ship with Windows 2000. Many desktop vendors, including 3Com, Compaq, Dell, Hewlett-Packard, IBM, Intel and NEC, are writing CIM "providers" that take information from their existing management agents and send it to WMI. Meanwhile, several CIM-compliant desktop management products, such as BMC Software's Pilot 3.3, Computer Associates' Unicenter TNG, Microsoft's SMS, Tivoli NetView and NetIQ's AppManager Suite, can use WMI as a single point of contact for all the information they need about a desktop.

Early users report several benefits to being able to manage Microsoft desktops via CIM (see story, this page). In order for CIM to fulfill its potential as an enterprise management standard, however, it must break out of the Microsoft desktop management niche and achieve a critical mass of vendor support.

Right now, CIM is at a kind of crossroads. At its annual conference last week, the DMTF released several pieces of the WBEM/CIM architecture. CIM Version 2.2 adds logical networking and user-related schemas, as well as DEN-specific CIM extensions. DMTF spokespeople predict that by year-end, CIM schemas for key areas of management, including applications, systems, networking and users, will be complete enough for vendors to implement. There will also be CIM extensions that address more specific types of systems, such as mass storage and Unix.

While network and systems management schema rapidly fall into place, the DMTF still has a long way to go when it comes to defining critical

areas of application management. What's more, application vendors will have to define product-specific extensions — no easy task, given the complexity of applications, the newness of CIM models and the lack of helpful tools, says Bob Kruger, vice president of Windows NT Solutions at BMC in Houston. After all, even Microsoft hasn't yet announced CIM support for its applications.

In other recent news, the DMTF last week released the first round of XML specifications. And Sun announced Solaris WBEM Services, a Java-based CIMOM that runs on Solaris systems. The CIMOM will be included in the next release of Solaris, due out next year; Sun also plans to license it to other vendors. In the meantime, Sun's Easy-Access Server Solaris bundle, slated for release in

August, is expected to fully support CIM.

A Unix-based CIMOM can perform the same coordinator/liaison services as WMI for the disparate elements of a Unix system. Desktop vendors, such as Compaq and Intel, have already indicated their desire to write providers to Unix-based CIMOMs.

Compaq plans to develop CIM object managers for its Digital and Tandem operating systems, and to push partners such as Novell and The Santa Cruz Operation to do the same for their products, says Ed Reynolds, Compaq's director of product marketing. "The operating system is the logical place where management instrumentation can come together because drivers have to deal with it."

And network hardware vendors want a choice of Unix- and NT-based CIMOM models to support their management applications.

One crucial missing component that the DMTF plans to introduce this fall is a CIM- and WBEM-compliance testing program.

Indeed, vendor support of CIM will be gradual and unending, as is the process of defining CIM schemas and associations. Cisco, for example, implemented the completed CIM network asset schema in CiscoWorks last fall. The management platform can now send configuration information to frameworks such as OpenView and Tivoli NetView.

"We are deciding what the most valuable pieces of information to expose first via CIM are," says Joel Strassner, Cisco architect.

Further complicating vendors' CIM support strategies is the issue of what role existing standards such as DMI and SNMP will play in CIM- and WBEM-based management.

Right now, CIM "providers" and software from vendors such as BMC and Manage.Com let SNMP and DMI agents coexist and interoperate with CIM object managers. The danger is that CIM never quite comes into its own, remaining an adjunct to the older standards.

Leading management platform vendors such as CA, HP and Tivoli are treating CIM as a complement or alternative to SNMP and DMI. "In core network manage-

*Continued on page 62*

## NABISCO EATS UP CIM

**A**s a project manager of Windows NT management services at Nabisco, Rich Burton has been lucky enough to be among the first to experience firsthand what a difference the Common Information Model (CIM) can make in systems management.

Virtually all of the products Burton uses for system management at the Parsippany, N.J., food manufacturer support CIM or soon will. The products include Tivoli Enterprise, NetIQ's AppManager Suite and Microsoft's Systems Management Server (SMS) 2.0.

So what does all this mean for Nabisco's systems administrators?

For one thing, the CIM-compliant SMS 2.0 gives systems administrators a much richer set of attributes that they can use to determine which desktops or servers get software updates. "With 1.2, we were always delivering to a machine with a unique ID that SMS generated," Burton says. "Now we can utilize properties like User ID, or group membership or system attributes to target software updates. It makes

delivery much easier and faster."

Plus, Burton's group can extend the CIM schemas provided in SMS 2.0 to describe additional classes, resources or components, he says. For example, Burton is looking at extending the software inventory schemas to describe attributes specific to Nabisco's applications, such as the Dynamic Link Library version number or an application's last time of use.

Burton is also preparing to exploit the extended NT server monitoring capabilities that NetIQ's AppManager Suite provides via CIM. The performance management platform uses CIM, as well as other types of management agents such as SNMP, to provide proactive monitoring and the ability to take corrective action before thresholds are exceeded.

Is this enough to sell Burton on CIM? Just ask him. "When I talk about management with vendors now, one of the first questions I ask is, 'What are your plans for CIM?'" Burton says. "A lot of them say, 'What's that?'"

— Elisabeth Horwitt





<sup>1</sup>Estimated reseller price for model 390/ENU. Actual prices may vary. <sup>2</sup>Available only on model 770/BAU. <sup>3</sup>INTEL independent study using Winstone Perl testing, July 1998. <sup>4</sup>SOFRES Intersearch, July 1998. mhz denotes microprocessor internal clock speed only; other factors may also affect application performance. gb=1 billion bytes for HDD. PCs referred to in this ad include an operating system. IBM product names are trademarks of International Business Machines Corporation. Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. © 1999 IBM Corp. All rights reserved.

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Continued from page 60

ment, we don't see anyone implementing WBEM to replace SNMP," says Jiro Haselmaier, marketing manager for HP OpenView Network Node Manager.

SNMP Research plans to have its forthcoming application and systems

management applications support CIM as a means of sharing information with other applications, says Jeff Case, company founder and chief technology officer.

However, SNMP Research will continue to use SNMP Version 3 for the actual management. He insists that SNMP 3 is

just as good or better than CIM.

MCI WorldCom's Tindall disagrees. "SNMP and DMI do standardize management definitions some, but we still have to write our own scripts to pull information together and do our own correlation," he says.

Another cloud on the horizon is the

question of when, or even if, vendors will adopt XML as the standard way to access CIM information. XML is key to CIM because it ensures that different management systems and applications can exchange and use each other's CIM-based information, McConnell says.

At this point, however, few management vendors have announced XML support. Companies such as BMC and Microsoft have indicated that XML will be just one of several methods they'll use to present and exchange CIM data (Microsoft's Component Object Model being another). Vendors such as Compaq are waiting for XML specifications to stabilize, which Reynolds predicts will happen in the third or fourth quarter.

What's needed right now, analysts and vendors agree, is a strong contingent of CIM-savvy companies such as MCI WorldCom to elicit whole-hearted and broad industry support of the standard.

The DMTF has recently accelerated its CIM education efforts. The group hosted sessions at this spring's NetWorld+Interop '99 trade show and founded a CIM Customer Forum, whose members will hopefully spread the CIM gospel.

For the moment, at least, vendors aren't exactly trumpeting the news about CIM. UPS' Gunn, for instance, heard about CIM at a Network World Town Meeting. "None of the vendors I deal with have approached me on the subject," he says.

It's not surprising, then, that a current CIM user, such as Internet Banking's Wood, can appreciate the benefits without realizing that the standard is responsible.

Of course, SNMP, too, was once an esoteric network management standard whose subtle nuances were understood only by Internet Engineering Task Force product engineering gurus.

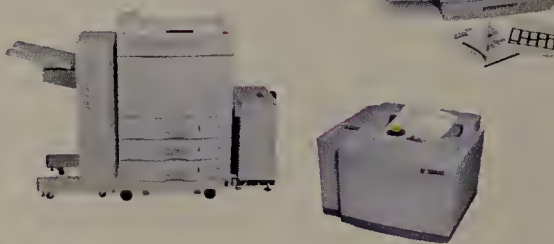
*Horwitt is a freelance writer and consultant in Waban, Mass. She can be reached at EHorwitt@compuserve.com.*

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- The Desktop Management Task Force's CIM FAQ file answers common questions.
- Consult *Network World's* update on the status of CIM schema definitions.



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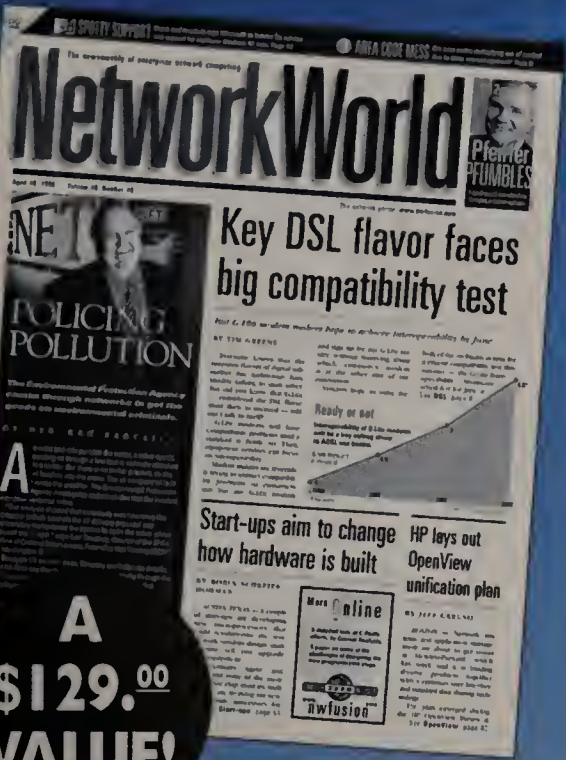
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## Review

# REINING IN THE ROAD WARRIOR

What's worse than managing an enterprise full of PCs? Managing an enterprise full of PCs that weigh about six pounds each and fit inside a briefcase. Mobile clients are inherently more complex to manage than network-attached desktops. Mobile clients connect to the home LAN on an unpredictable schedule, and when they do dial in, their bandwidth is seriously constrained. How do you roll out a Windows 95 Year 2000 update to users who may not be in the office until next February?

A new crop of software aimed at managing mobile systems, from PCs to PalmPilots, has arrived to help rein in the road warrior. We looked at Sterling Commerce's Connect:Manage 2.0, Callisto Software's Orbiter 3.0, and Mobile Automation 3.0 from Mobile Automation — three applications that provide software distribution and asset management capabilities to remote systems.

Sterling's Connect:Manage is the most comprehensive product. It can support more than a single server, which makes it well-suited for an enterprise intranet. Unlike the others, Connect:Manage offers a browser interface and employs the Windows channel paradigm for browsing content available for downloading.

Callisto's Orbiter has several components that interoperate — an NT server process, a client agent and an administration console. Orbiter also has native TCP/IP support and built-in hardware and software inventory capabilities, both of which Mobile Automation lacks. The capabilities let you get a detailed view of users' hardware and a full list of installed software. Orbiter distinguishes between commercial and unknown (proprietary) applications.

Mobile Automation is similar to Orbiter, with several important differences. Mobile Automation has intuitive tools that help administrators manage PCs, PalmPilots and Windows CE devices; core components that include a management console; a server process that manages the distribution and collection of information; a client agent; and an installation scripting editor. Mobile Automation requires little training, and it let us easily identify our test PCs and target software updates.

All these products have strengths and weaknesses. Connect:Manage has the most flexible architecture, including support for various plug-in modules, Web support and the Windows channel paradigm. Unlike the other products, multiple Connect:Manage servers can communicate with each other on the LAN — a big advantage for large enterprises. Orbiter supports TCP/IP, and is a fine all-around mobile client manager. Mobile Automation is great for a small enterprise, in which using e-mail makes the most sense. In a large organization, however, there is the potential to overload an e-mail system with too many attachments.

## Managing mobile workers

Sterling's Connect:Manage uses a channel paradigm, in contrast to the job or activity distribution approaches of Orbiter and Mobile Automation. Connect:Manage supports four different types of channels: software distribution, session manager, document management and transmitter. The transmitter

**Connect:Manage, Orbiter and Mobile Automation all do a good job of managing mobile users.**

channel provides a means of broadcasting the presence of other Connect:Manage servers in a larger enterprise network, which makes this product more scalable than its counterparts.

Sterling offers other channel types that plug in to the Connect:Manage architecture, including hardware and software inventory management. However, they are available as separate products and were not included in this review.

Connect:Manage updates clients using the software distribution and session manager channels. Software distribution channels deliver either shrink-wrapped or relatively simple home-grown applications. Enter a source directory and setup file name, and the package is automatically compressed. Administrators comfortable with third-party installation editors can use them to create packages.

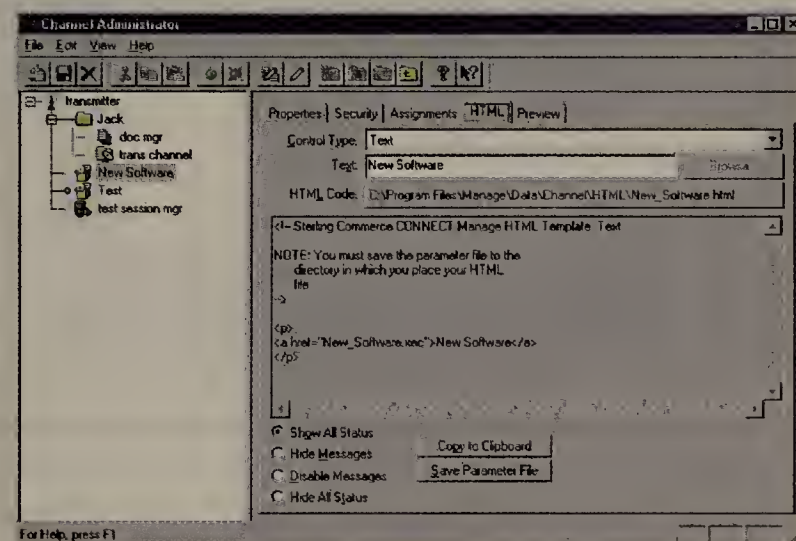
The session manager channel is used for more complex tasks and includes a scripting language, which we used to create a simple distribution job with no problems.

Connect:Manage also offers document management features. A group of related documents can be placed into a channel. When users subscribe to this channel, they get the most up-to-date version of its contents.

You have to publish channels in the administrator

## Connect:Manage Channel Administrator console

Connect:Manage dynamically creates HTML code for administrators to put on a Web site. When users click on the link, this code launches the Connect:Manage Web plug-in to install the software.



program to enable user access. By default, channels are available to all users. You can enable and require authentication via Windows NT's group management. Connect:Manage is the only product of the three we reviewed that supports NT authentication. Add-on software from Sterling is required to limit access at the user level.

Depending on the configuration settings of each channel, information can be pushed or pulled to the desktop. The proprietary interface and channel archi-

ScoreCard	Management/ administration 25%	Reporting capabilities 20%	TCP/IP support 15%	E-mail support 10%	User Interface 10%	Installation 10%	Documentation and online help 10%	Total score
Connect:Manage 2.0	8 x .25 = 2.00	8 x .20 = 1.60	10 x .15 = 1.50	3 x .10 = 0.30	8 x .10 = 0.80	7 x .10 = 0.70	6 x .10 = 0.60	7.50
Orbiter 3.0	7 x .25 = 1.75	8 x .20 = 1.60	10 x .15 = 1.50	5 x .10 = 0.50	7 x .10 = 0.70	7 x .10 = 0.70	7 x .10 = 0.70	7.45
Mobile Automation 3.0	7 x .25 = 1.75	7 x .20 = 1.40	3 x .15 = 0.45	10 x .10 = 1.00	7 x .10 = 0.70	9 x .10 = 0.90	7 x .10 = 0.70	6.90

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.



ecture are easy enough for most users to grasp. Like Orbiter, the TCP/IP-based Connect:Manage supports checkpoint and restart capabilities when transmitting data or applications to mobile users.

Using Callisto's Orbiter is a snap. Orbiter refers to actions carried out on a workstation as jobs, and you create jobs on the administration console. Jobs come in four basic flavors: inventory, change analysis, maintenance and software distribution.

Creating inventory and maintenance jobs requires little input. For inventory jobs — hardware and software — select target machines and determine the schedule or frequency with which the job should run. While the inventory applet is not Desktop Management Interface-compliant, it produces a good amount of detail about each system, including operating system version, service packs, processor, total memory and hard disk space.

Software distribution jobs are also simple to create. Orbiter does not include a scripting engine. It assumes you use either a setup routine that comes with the

product being installed or a third-party installer such as Install-Shield.

One particularly useful Orbiter software distribution feature is the ability to synchronize the contents of a source folder. You can create a recurring schedule when the job is created. Each time the job runs, it checks the original source directory for updated files. This process helps keep data that requires frequent updates synchronized with little administration overhead.

The change analysis feature is a potential support boon, depending on the level of standardization in an organization. Change analysis takes a snapshot

of a system's key files (including the registry, AUTOEXEC.BAT and CONFIG.SYS) and compares it to a standard set of files.

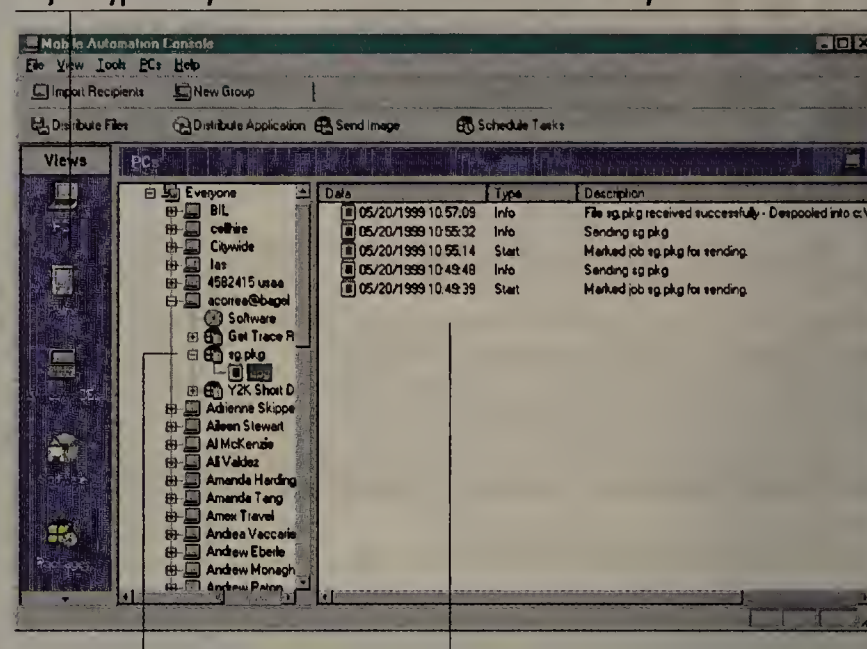
The theory is that when a mobile user calls the support desk with a problem, the support staff can see the changes the user made that resulted in the errors. Given the myriad of potential configuration problems with networked applications, it's hard to say how successful this feature would be in every case.

The client agent has two main features that give dial-up users some breathing room. Most importantly, when using TCP/IP, Orbiter uses a checkpoint and restart mechanism during software distribution jobs. This means that if a dial-up connection is broken during a download, the job restarts from the last successful package transmitted, rather than from the beginning.

Because Orbiter software distribution jobs can run without alerting the user on the client PC, checkpoint and restart lets

## Mobile Automation console

Object types let you zero in on the clients or software you want to monitor.

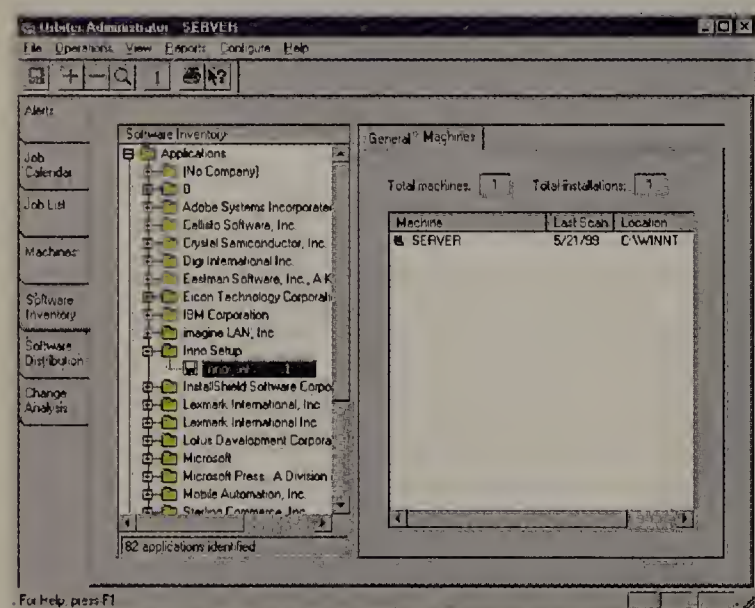


For each client PC, you can see all software delivered ...

... as well as a log of the installation.

## Orbiter Administrator console

The Software Inventory screen of Orbiter's tabbed interface shows a list of inventoried software for all machines on the left. For each package, the workstations that have the software installed appear on the right.



## Net Results

### Connect:Manage 2.0

Sterling Commerce  
(214) 981-1000  
[www.stercomm.com/pdsv/ploc/conn/mang/psum-01.html](http://www.stercomm.com/pdsv/ploc/conn/mang/psum-01.html)  
\$5,000 per server, \$50 per client

#### Pros

- ▲ Supports browser and proprietary client
- ▲ Intuitive channel architecture
- ▲ Native NT groups used for authentication

#### Cons

- ▼ Client installation requires IT intervention
- ▼ Client agent easily bypassed

### Orbiter 3.0

Callisto Software  
(630) 682-8200  
[www.callisto.com/orbiter.html](http://www.callisto.com/orbiter.html)  
Orbiter server, \$5,000; Orbiter clients, \$150 to \$100 depending on quantity

#### Pros

- ▲ Native TCP/IP support
- ▲ A checkpoint and restart mechanism for failed transmissions
- ▲ Mobile profiles optimize bandwidth

#### Cons

- ▼ No native NT or e-mail integration
- ▼ Client installation requires IT intervention

### Mobile Automation 3.0

Mobile Automation  
(800) 344-1150  
[www.mobileautomation.com/products/index.htm](http://www.mobileautomation.com/products/index.htm)  
\$4,995 for one server and 50 client licenses. Additional clients \$174 to \$135 depending on quantity

#### Pros

- ▲ Comprehensive e-mail support
- ▲ Easy use and setup
- ▲ Basic software installation scripting included

#### Cons

- ▼ No support for native TCP/IP

software updates occur even when bandwidth availability is spotty.

Orbiter also employs a feature called Mobile Profiles. The profiles, which can be used on either a user or group level, specify when to update clients and how much bandwidth to use when communicating with clients. This is especially useful during software distribution. There are four levels of profiles, ranging from "always in the office" to "never in the office." The underlying intent is to not waste bandwidth on users who will be in the office soon or for noncritical distribution jobs.

Like Connect:Manage and Orbiter, Mobile Automation is a breeze to use. All activities are managed through a server-based console. The most common activity is the creation and distribution of software packages. The Package Editor is a fully functional — although not overly sophisticated — scripting tool. For the novice, the Package Editor has a Wizard interface, which is useful for the simplest installations.

Anyone familiar with a commercial scripting tool can easily adapt to the new environment. Mobile Automation packages can distribute and launch any executable. When the packages are compiled, they can be broken into subpackages of definable lengths and sent sequentially. As soon as the client agent has acknowledged receipts of all subpackages, the agent starts the installation.

The client agent logs the installation process and reports back to the management console during installation, letting you quickly view the installation status.

Mobile Automation is the only product we tested that can directly manage Palm and Windows CE devices. When you install Mobile Automation's client agent, it automatically detects the personal digital assistant synchronization software and reports it to the Mobile Automation server process. You can distribute new applications to these devices and easily deploy them the next time the devices synchronize with their host PCs.

## Server installation

Installing and configuring Connect:Manage's console is simple. You only need to install a service that Connect:Manage calls a transmitter, with administration rights. The product uses the transmitter to communicate with other Connect:Manage servers on the





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network. Context-sensitive online help was also useful, and the documentation provided a good general overview of the process.

Installation and setup of the Orbiter server components were straightforward. We created an Orbiter user ID on our NT server with administration priv-

ileges capable of running the Orbiter NT service. We configured the server for native TCP/IP support. Orbiter offers e-mail transport as well, though with fewer e-mail options than Mobile Automation. However, Orbiter's support for TCP/IP makes this less of an issue. The product also has good online help

and documentation.

We installed Mobile Automation's server software and were up and running in less than half an hour. While we installed the software on our NT server, it also runs on a Windows 9x workstation. Unlike the other products in this review, Mobile Automation

requires an e-mail system for the transport of its distribution jobs. Mobile Automation figures that a company is more likely to have an e-mail system for remote users than a remote IP dial-up service. However, this reliance on the corporate e-mail infrastructure is limiting for organizations in which dial-up IP services are available to users. We had to enter a username and password during the server installation process for an e-mail administration account. Mobile Automation includes good documentation and context-sensitive online help.

## Client installation

Once you configure the server software, the next step is to create a setup package to deploy to client systems. Connect:Manage's client agent software, Connect:Manage Scheduler, is not directly customizable. You must enter the name of the Connect:Manage transmitter when you visit the client PC during installation, although a clever administrator can create a customizable installation package for the 4M-byte client using a product such as InstallShield.

The client for Connect:Manage comes in two flavors: a full-featured proprietary client and a "lite" browser plug-in. The proprietary client has a Windows Explorer-like interface and is useful for navigating around different Connect:Manage channels.

The Connect:Manage browser plug-in is triggered by HTML code an administrator publishes to a Web site. The code is dynamically created by the server process when you create an

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## How We Did It

We set up a three node Ethernet LAN consisting of a Windows NT 4.0 server and two Windows 98 workstations. The server ran Lotus Domino 4.5.7 with Post Office Protocol 3 (POP3) and Simple Mail Transfer Protocol support, and was configured with Microsoft's Remote Access Service (RAS). The Windows 98 workstations ran Outlook Express/POP3 and Lotus Notes e mail clients, as well as Internet Explorer 4, and were configured with a dial up connection to the RAS server.

We distributed commercial software applications and data directories with each product, on the LAN and via dialup. We interrupted data transmissions to see how the products would handle restarting the event. We also analyzed the log files generated by each to understand the type of reporting information.



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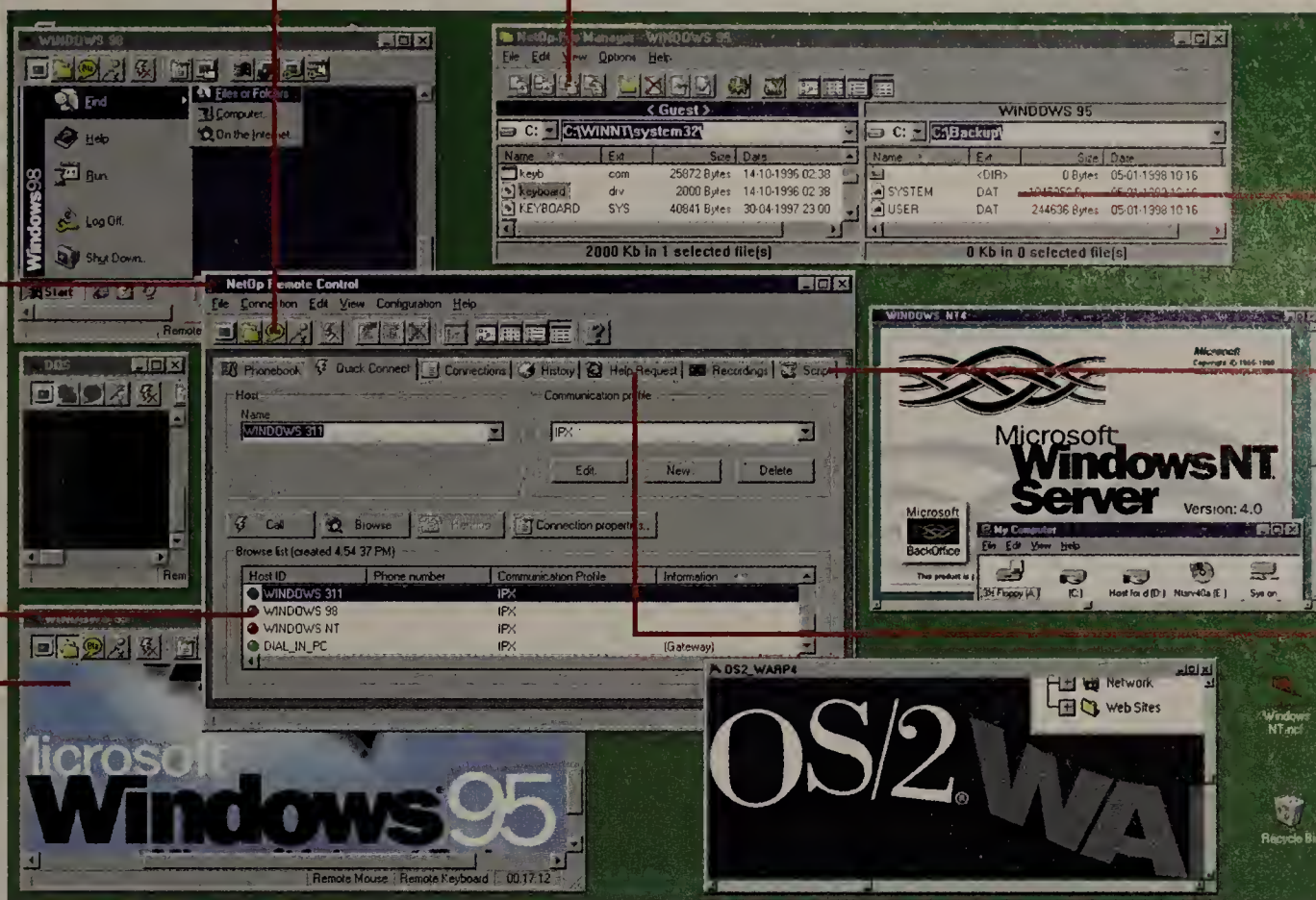
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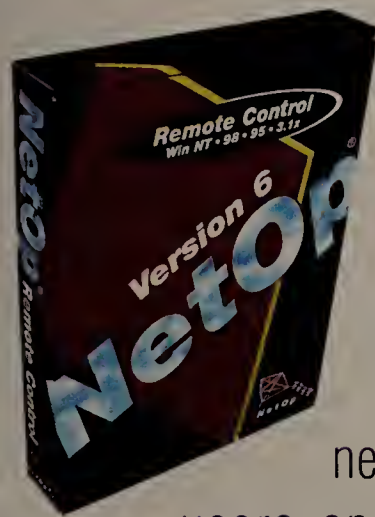
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# Review

application deployment package. When a user with the browser plug-in clicks on the HTML code, the plug-in is automatically launched and performs the installation. However, as with the proprietary client, it is too easy for browser users to press the cancel button to avoid a download.

Installation of Orbiter's client, while simple, needs some improvement. As with Connect:Manage, you can't configure the client installation package prior to distribution. The 8.5M-byte installation, which is practically speaking too big to send over a modem, requires someone on the client PC to

input the server name and transport type. The parameters are too technical to trust to end users, so an IT visit is required to each workstation. You perform all Mobile Automation client management functions at the Mobile Automation Console.

To create a setup package for Mobile

Automation, you must first specify your e-mail system. Mobile Automation supports a variety of mail systems, including Notes, Exchange, cc:Mail, Group-Wise and Internet Post Office Protocol 3/Simple Mail Transfer Protocol. We selected Internet mail and specified a dedicated Mobile Automation administration account.

Other configuration parameters include whether to display the Mobile Automation Agent that runs on client workstations, the type of network connection (dial-up or LAN-based) and the schedule on which the agent checks for new packages. The schedule can be time-based or triggered by a successful dial-up network connection.

As soon as all information is entered into Mobile Automation, you are prompted to compile it into either a single 2M-byte file or smaller files that can be sent as separate packages and assembled when they all arrive on the client. Subdividing client packages is one of the principal means by which Mobile Automation reduces the overhead for remote users because you can choose to send the packages out at convenient times.

After the package is compiled, you can e-mail it to selected recipients. Mobile Automation lets you manually enter e-mail addresses, or the software can import recipients from the selected mail system.

Unfortunately, you have to import the names again when you have user additions, deletions and modifications; there is no real-time synchronization between the Mobile Automation and e-mail system address books.

## Common cause

Connect:Manage is a solid player in the remote management market. It is intended to be the foundation for a larger architecture, with add-ons ranging from client backup software to integration with IBM's Tivoli. On its own, though, Connect:Manage is certain to bring some relief to the problems of mobile-systems management.

It has an intuitive interface, a comprehensive set of tools and a client agent that makes the most out of limited bandwidth. To be a true enterprise tool, Orbiter should integrate into either NT's directory or the chosen e-mail system's address book, rather than managing two distinct systems.

Overall, Mobile Automation is a solid tool that is best-suited for mid-size enterprises because of its reliance on e-mail as a transport mechanism. The product needs native IP services tied into the NT directory to move to the next level of sophistication.

*Goldberg, a contributing editor at Network World for five years, manages mobile systems in a large enterprise environment. He can be reached at [sgoldberg@pobox.com](mailto:sgoldberg@pobox.com)*

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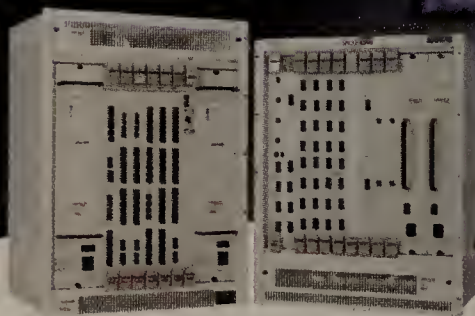
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# Review

# MOVING TOWARD CONVERGENCE

**W**ith the industry buzz about voice/data convergence getting louder all the time, you may soon find your phone system tied into your data network, with you centrally controlling the whole thing from your PC.

We looked at AltiGen Communications' AltiServ, a Windows NT-based telephone and voice mail system.

AltiServ is a combination PBX, voice mail and messaging system housed in a single NT server. With the addition of AltiWare IP, telephone calls can be routed over an IP network to another AltiServ server.

While AltiServ Open Edition (OE) 2.1 has been on the market since late last year, we now think it warrants closer examination because it blends PBX, PC and messaging technologies into one system, and it costs anywhere from 30% to 75% less than traditional phone systems with similar feature sets.

## ScoreCard

### AltiServ OE 2.1

Ease of use for end users 40%	9 x .40 = 3.60
System reliability 40%	8 x .40 = 3.20
System configuration 10%	5 x .10 = 0.50
Installation 5%	10 x .05 = 0.50
Documentation 5%	9 x .05 = 0.45
<b>Total score</b>	<b>8.25</b>

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. The World Class award goes to products that score 9.0 or better.

AltiServ is extremely simple to set up and requires little ongoing management. End users can view and change their voice mail configurations using a Web browser.

Our tests show this product is well-suited for companies with several branch offices, but some of the standing hardware limitations affect its overall scalability. Currently, AltiServ is limited to 144 users per server because the system uses ISA slots for the PBX/voice mail functionality and PCI slots for voice over IP.

We first tested AltiServ with voice traffic only. Our users reported the system was easy to use, and their voices were clear and easily recognizable.

Next, using a packet generator we placed a moderate network load across our pseudo-WAN link. Conversation quality degraded noticeably. Users said it sounded like they had a terrible cellular phone connection.

We thought the problem was a traffic issue across the WAN link rather than a problem with AltiServ, so we configured the routers to use Priority Queuing (packet prioritization) for the voice-over-IP packets. Sure enough, voice quality returned to its previous level.

In the version of AltiWare IP we tested, the bandwidth requirements for voice over IP were surprisingly large compared to competitors' voice-over-IP products.

## How we did it

We simulated two branch offices connected by a private IP network. We used two Cisco 2501 routers with DSU/CSU connections and a cross over cable to simulate the WAN.

We used two identical 333 MHz Celeron servers with 128M bytes of RAM, a 5.4G byte IDE disk drive and a 3Com 3C905B network card, running Windows NT Server 4.0 with Service Pack 3 and Internet Information Server 3. Each system included an ISA based Quantum PBX card and a PCI based Triton Display Systems Protocol card for sending voice over IP traffic through the routers. Each server also

## AltiGen's PC-based PBX bets your phone system on NT.

AltiWare IP requires 96K bytes per channel whereas other voice-over-IP products that support compression require only 10K to 20K bytes per channel.

AltiGen is expected to release a new version of AltiWare IP this fall that will support compression.

Because users are accustomed to 24-7 telephone uptime, we also tested AltiServ's power failure transfer feature, which lets designated telephone extensions remain open in case of an interruption in electrical power.

We simulated a power outage in Office A. A UPS attached to the server — which must be purchased separately — kicked in, and users noticed nothing.

Next we simulated a complete power failure in Office B. Calls were dropped and messages being left were incomplete. However, all incoming calls were routed to the designated extensions in that office segment. Outbound calls could only be placed from the same extensions. All other phones were dead, and all messaging features were unavailable. Once power was restored and the server finished rebooting, everything functioned as if nothing happened.

Neither AltiGen nor its resellers recommend the added expense of error checking and correcting memory or RAID for high availability. AltiServ only taps the hard disk when a message is being left, so an AltiServ box is generally less stressed than even a departmental NT file server, they say.

The management of an AltiServ phone system is divided into three parts. Installation and configuration are handled by an administrator. End users employ a Web browser to maintain their own mailbox settings. Using an optional add-on called AltiConsole, a live

operator can manage the flow of incoming and outgoing telephone calls.

At all levels, AltiGen has done an outstanding job of making menus simple, easy to understand and intuitive. Hardware installation was easy, and installing the software took less than 15 minutes. We accepted all the defaults.

## Net Results

### AltiServ OE 2.1, AltiWare IP 2.1, AltiConsole 2.1

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#### Pros

- ▲ Easy to use
- ▲ Extensive set of integrated PBX and voice mail features, including the ability to use a browser to see voice mail messages and to configure a mailbox
- ▲ Lets users integrate voice mail messages and e-mail
- ▲ GUI interface eases system administration
- ▲ Costs 30% to 75% less than traditional telephone systems with similar features

#### Cons

- ▼ Voice-over-IP feature currently requires too much bandwidth

To activate individual extensions, all you have to do is plug a telephone into the system and pick up the receiver.

The Web-based tool used for voice mail access is called AltiReach. It lets users view messages and make changes to mailbox settings from anywhere, as long as they can connect to the AltiGen server, through a dial-up connection or through the Internet.

Over the past decade, telephone systems, like computer systems, have become smaller, more powerful and less expensive. With AltiServ, AltiGen is making it easier to contemplate blending your phone service with your data network.

Spindler is a technology consultant based in San Francisco. He can be reached at [spindler@dnai.com](mailto:spindler@dnai.com).





## Cool Tools Quick takes on high-tech toys

Lee Schlesinger, Test Center Director

### HELLO, COMPUTER?

I've been testing voice recognition software for at least five years. I haven't written about any packages because I haven't found one that works

well enough for me to use for more than a few minutes without becoming frustrated.

That day may be coming, however,

with the release of the latest generation of speech recognition products. Lernout & Hauspie's (L&H) VoiceXpress 4 Professional, which came out

this month, "typed" 120 to 130 words per minute with an average of nine recognition errors when I tested it on a 450-MHz Pentium III with 128M bytes of memory. Compare that to my typing about 60 words per minute, with three errors.

I was fairly happy with the speed and accuracy, especially considering you can improve the accuracy several ways. First, you have to reduce the product's sensitivity to background noise. If you don't, it interprets random sounds as random words when you're not talking and mangles other words when you are. Keep the microphone away from white noise sources such as fans. Each time you sit down to dictate, tune the microphone.

Second, make sure you train the software to recognize your voice. L&H calls this process "enrollment." The company provides several passages for you to read into the microphone. Each takes about 10 minutes. Once you're done, the computer processes your speech to create internal models for your pronunciation. That process took about 75 seconds on my computer.

I suggest enrolling more than once; I found that recognition improved after I read a second passage.

You can improve accuracy further if you train the program as you go along. If VoiceXpress enters an incorrect word, you can highlight it and choose from a list of alternate words that you might have meant, or type in the correct one. If you click on the Train button, the program makes you pronounce the new word twice, after which it does a better job understanding it in the future. You can use a similar process in advance for any unusual words you use frequently. I noticed improvement the longer I worked with and trained the software.

I found VoiceXpress works better for dictation tasks than for editing documents. My tendinitis would have to turn into full-blown carpal tunnel syndrome before I'd edit using voice commands alone.

I don't have much room to touch on the product's cool features for executing complex commands by making simple statements such as "number the next two paragraphs," nor space to detail how it works with other Office applications, not just word processing. Though VoiceXpress 4 Professional can enter words faster than I can type, it can't find more space for my column. ▣

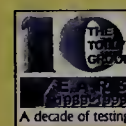


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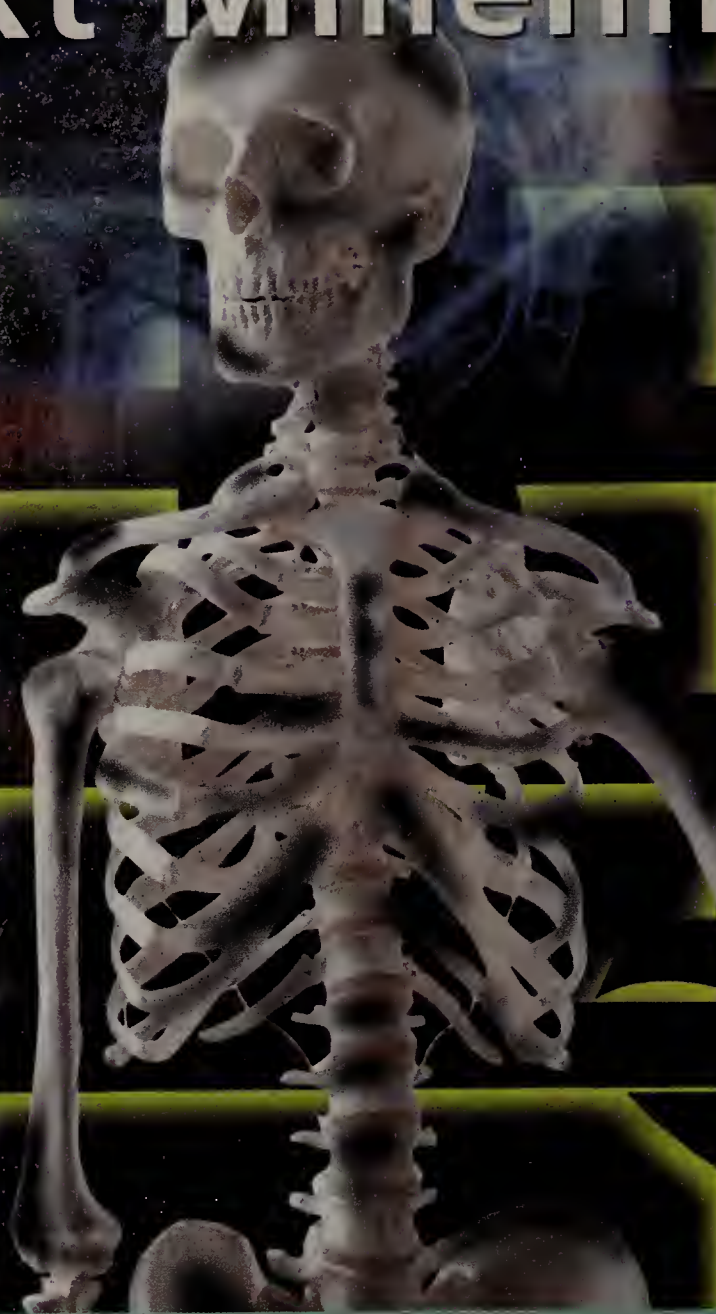
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# Management Strategies

Career Development, Project Management, Business Justification

## No sale

**The IT group that put itself on the auction block got a lot of attention, but few hiring managers are ready for that recruitment method.**

BY TONY KONTZER

Few people know whether the IT professionals who packaged themselves as a group of prospective hires for sale were for real or not, but the unusual move certainly generated a lot of attention among hiring managers and job seekers alike.

This spring, 16 disgruntled employees of an unidentified ISP listed their collective services for auction on the eBay Web site. Their asking price: \$3.14 million, including a \$20,000 signing bonus for each.

On the surface, the package sounded like it might be a human resources manager's dream. The group of apparently qualified people claimed to have built a major NT and Unix Web shop with more than 2,000 servers. Their experience included countless programming languages, operating systems, hardware components, Internet protocols, network infrastructure technologies ... you name it.

But after two days — and no offers — the listing was unceremoniously pulled. Perhaps members of the group got a bit worried that their employer would get wind of the auction if it stayed live for too long.

The lack of bids could have been tied to a number of factors: the likelihood that it was a crank; the asking price; the request for offers only from companies located within Silicon Valley; or the desire that all 16 be hired together.

All of the above probably played a role. Also worth mentioning is that the folks who hire network professionals for most Fortune 500 companies aren't quite ready for such a maverick approach to recruitment.

Presuming for a minute that this thing was legit, we asked a few companies for their reactions. "That just doesn't sound like something that would jibe with the

way we do business," says John Bisio, a spokesman for Bentonville, Ark., retail giant Wal-Mart.

"That's not something I could imagine us doing from an ethical standpoint," says Tracy Gordon of the San Francisco securities firm Charles Schwab.

Jackie Gentle, an HR spokeswoman for insurance provider Transamerica, also based in San Francisco, wondered why a group of 16 employees was available in the first place.

"I'd be suspect," Gentle says of the prospect of hiring the ISP team. "What was the nature of their decision to leave?"

No one from the group returned *Network World's* messages to the e-mail address it set up to field offers. But while the auction was still live, a spokesman for the anonymous team told Time Digital — the online version of *Time* magazine — that he and his cohorts were unhappy with their current employer's management.

eBay officials say the listing was unprecedented. "Other groups have offered services, but nothing of this nature or scope," says Kevin Pursglove, a company spokesman at eBay's San Jose headquarters. The team spokesman also told Time Digital that the group had, in fact, received some inquiries. While Pursglove says that the auction didn't produce any bids, it's not known whether the inquiries have resulted in any private offers to date.

But a development that followed on the heels of the ISP team's listing indicates a growing belief that auctioning talent online might not be such a far-fetched concept after all.

Career Web site Monster.com last month announced it was launching Monster Talent Market, an auction-style marketplace in which independent contractors can offer their skills to the highest bidder. Beginning July 4, contractors visiting the site can create a personal profile that defines their ideal assignment based on their experience, skills and education.



Jeff Taylor, CEO of Monster.com, says he expects the service to revolutionize the way independent contractors connect with hiring organizations.

"We're positioning the consumer for ultimate career control," Taylor says.

Clearly, corporate America would have a greater comfort level bidding for independent contractors rather than for disgruntled workers who are still employed. And there is, of course, a substantial distinction between one person marketing his job skills and a whole group marketing itself as a unit.

To that end, Rick Savage, a partner with Santa Monica, Calif.-based high-tech recruiter Littler Savage, says the ISP team's decision to seek employment as a unit was simply a bad idea.

Savage says he would expect potential employers to be scared away by the prospect of a bidding war. He suggests that a more effective tactic would be for the 16 employees to approach a venture capital firm and offer their services as a start-up staff.

If they are for real, "they're just shooting themselves in the foot," Savage says of approaching the general market as a group. "It comes off as arrogant. If they're so hot, why not start their own company?"

Kontzer is a freelance writer in San Jose. He can be reached at [tony@goodink.com](mailto:tony@goodink.com).

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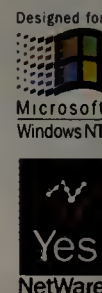


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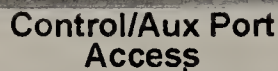
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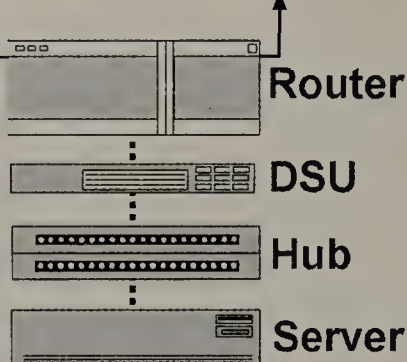


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- Left Pane:** Contains icons for 'Last Visited', 'Properties', and 'New File'.
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- Bottom Left Pane:** Shows a 2D drawing of the same part, with a coordinate system and dimensions.
- Bottom Right Pane:** Contains a table with columns for 'Name', 'Value', 'Units', and 'Type'. The table lists various parameters and their values.

The table data is as follows:

Name	Value	Units	Type
1. Length (mm)	100		mm
2. Hole Diameter	10		mm
3. Hole Depth	10		mm
4. Hole Position	10		mm
5. Hole Radius	10		mm
6. Hole Thickness	10		mm
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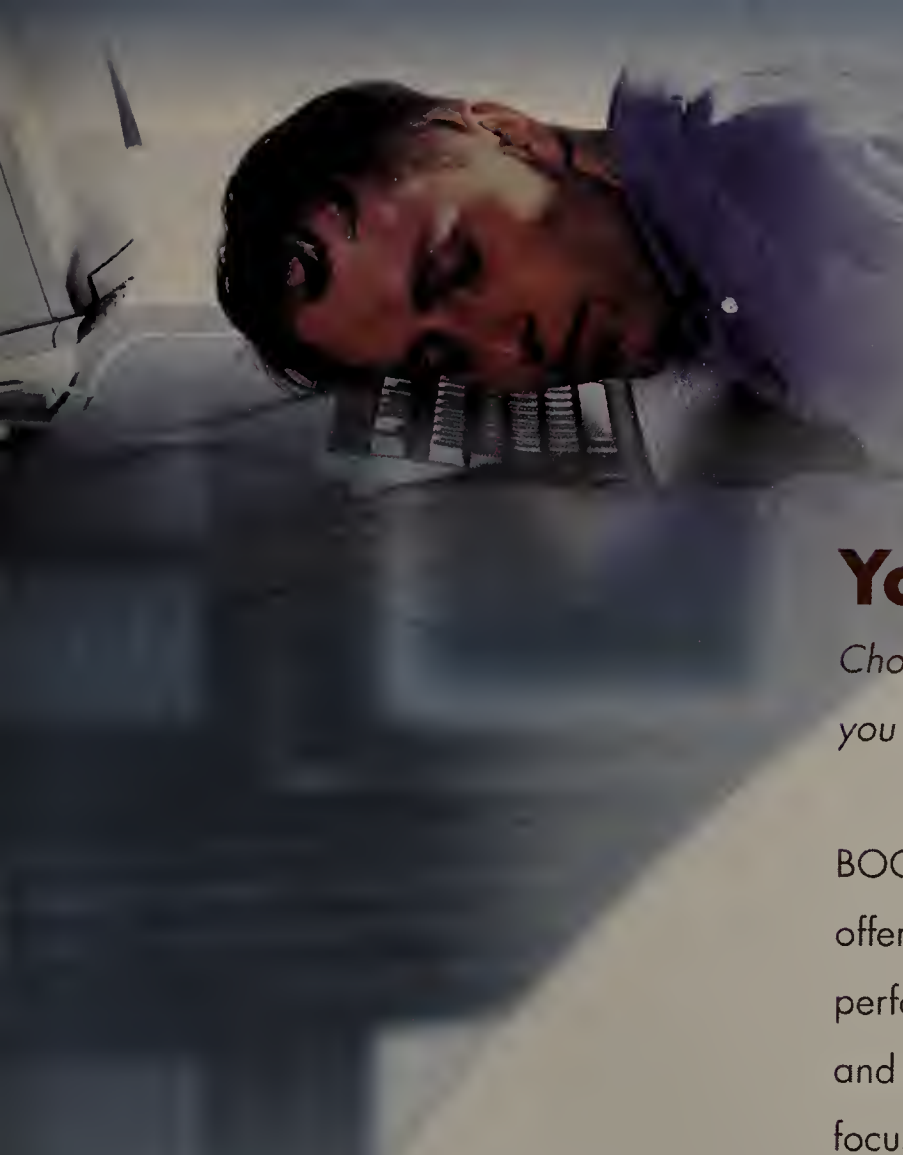
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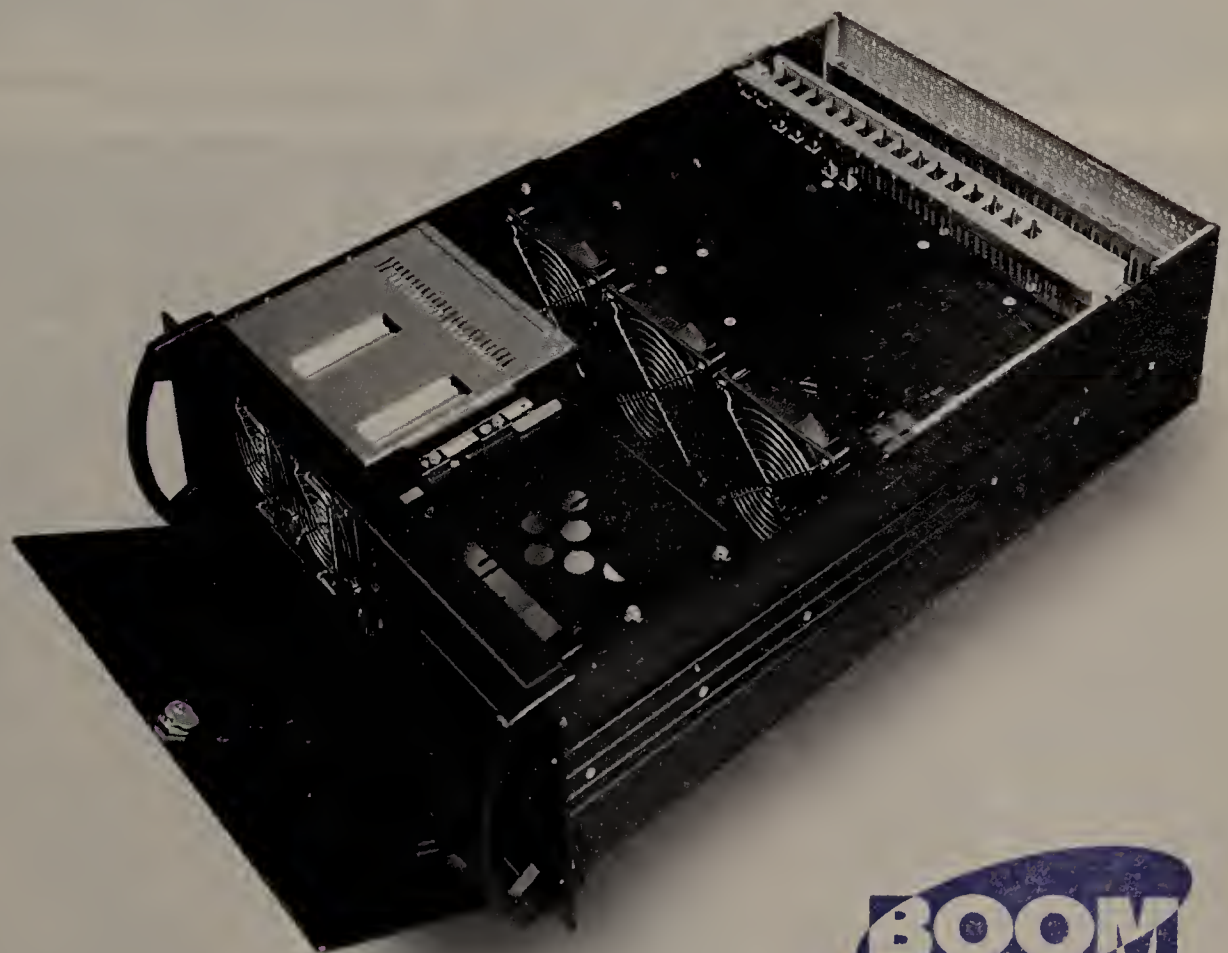


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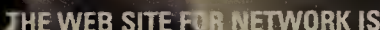
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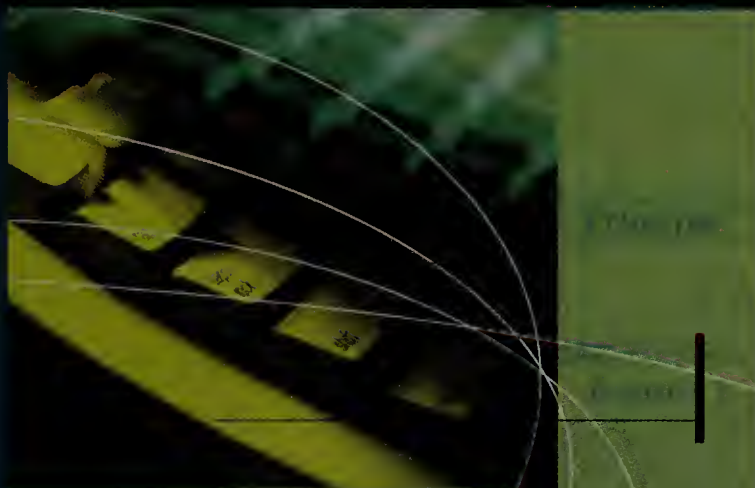




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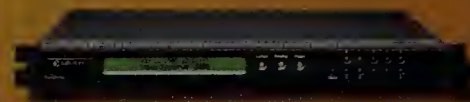


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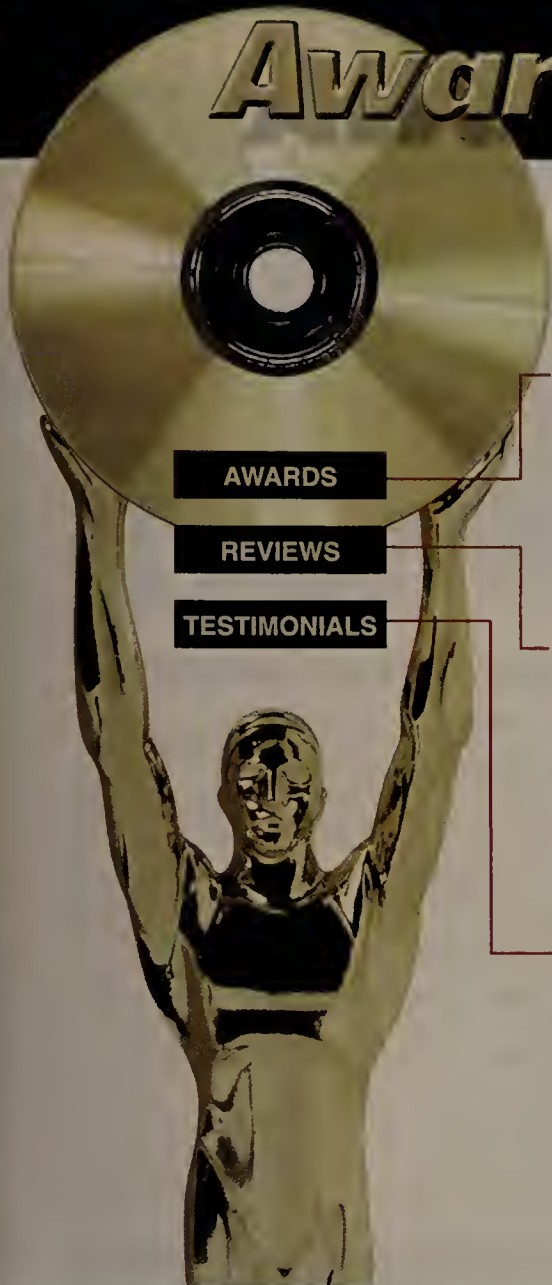
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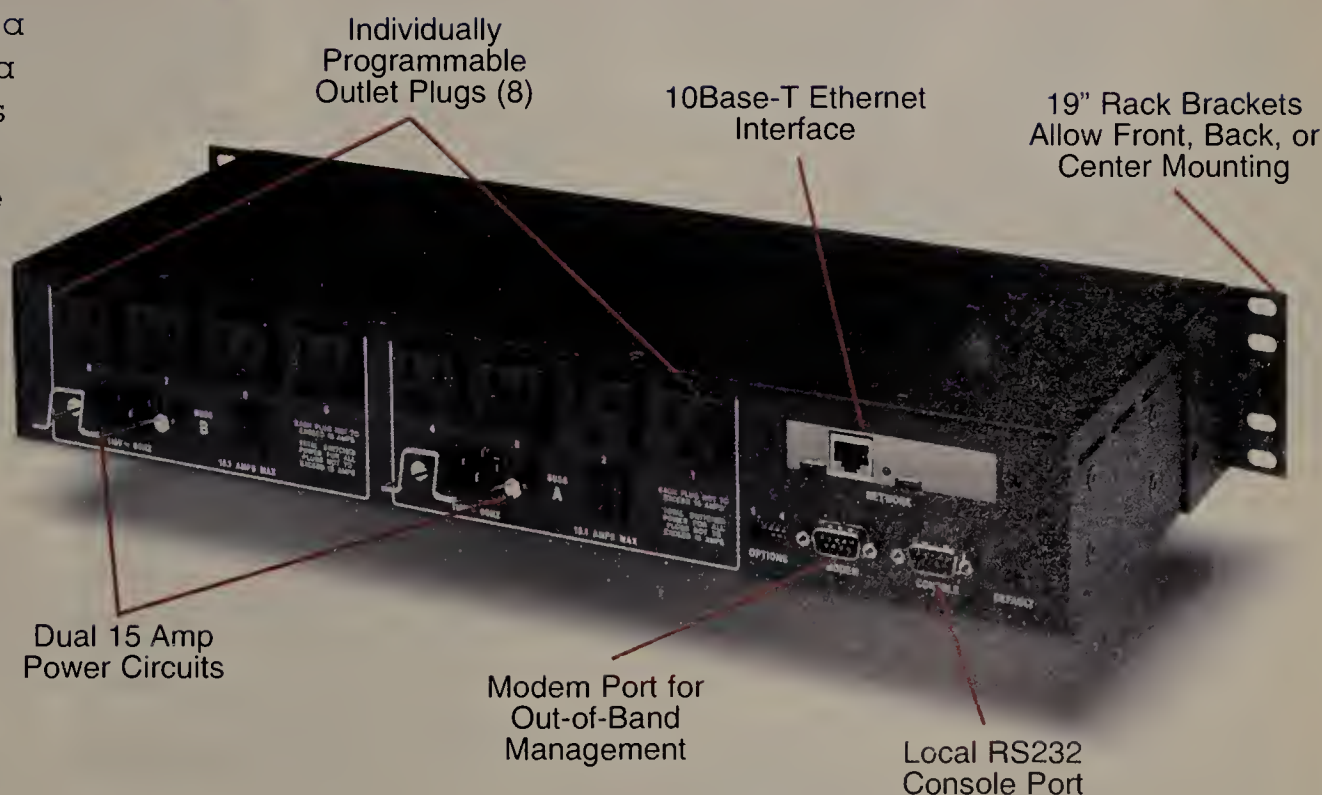
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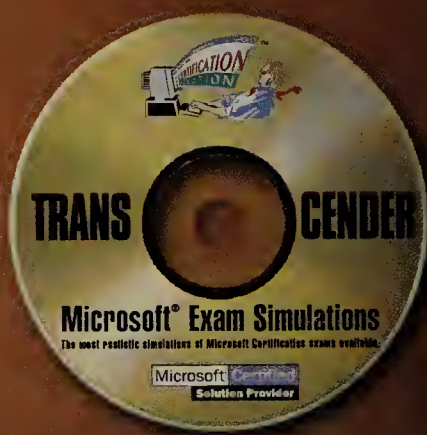


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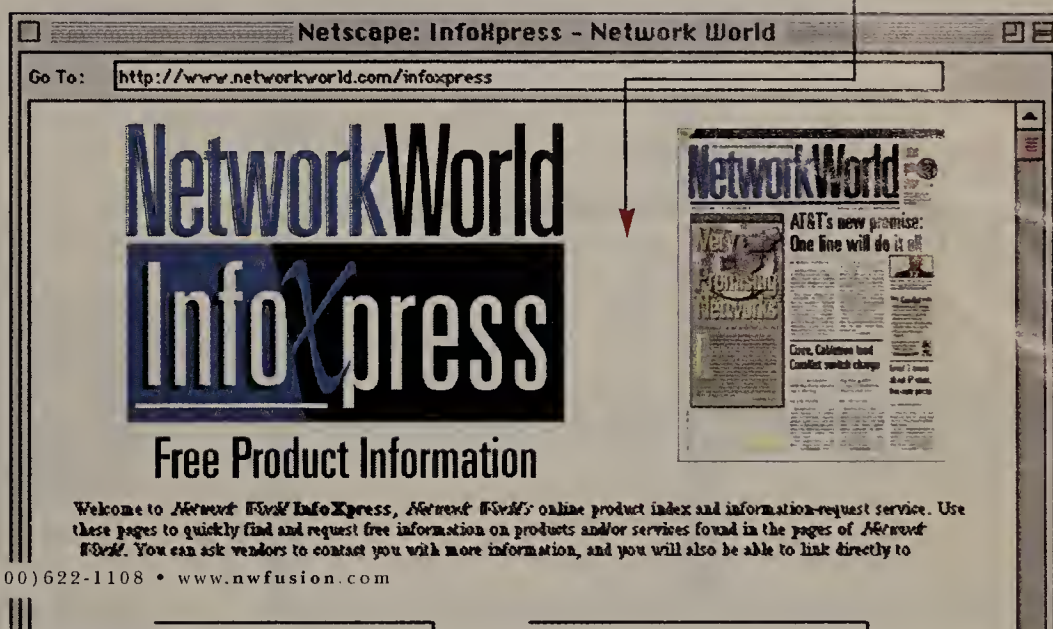


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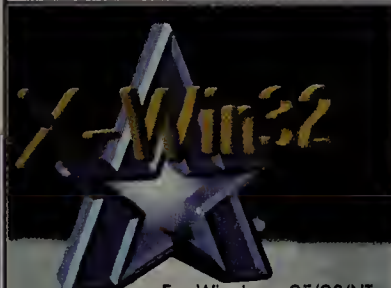
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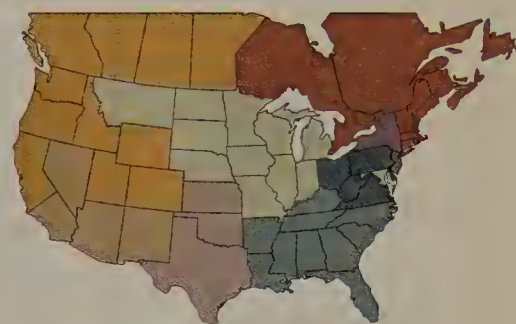
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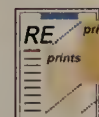


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**UUNET,**  
continued from page 1

work devices. The changes, which will bolster UUNET's dial-up VPN Services, now called UUDial, will take place over the next few months.

First, the company will give

its dial-up VPN customers better control over user-access privileges by rolling out its Active Network Infrastructure (ANI) in the fourth quarter. ANI uses Cisco Networking Services for Active Directory — co-developed by Microsoft — to provision network resources and simplify net access administration.

ANI will let business users who have a Lightweight Directory Access Protocol (LDAP) Version 3-compliant server on their networks synchronize access privilege data between their directories and a master directory stored on UUNET's networks.

This move means that when network managers remove or change dial-up users on their LDAP servers, the managers will not have to contact UUNET to make the same change on the UUNET network. Today, most users have to fill out an electronic form or contact a person at an ISP to add, drop or change a user's access privileges, says Eric Zines, senior consultant at TeleChoice, a consulting firm in Boston. Integrating internal LDAP directories with UUNET's ANI will expedite that process, Zines says.

UUNET will also use ANI to let users more easily set up group access policies. This ability will be especially useful when trying to manage an extranet that may have employees, business clients and vendors accessing all or parts of a network.

In addition to adding directory services to its dial-up VPN offering, UUNET is boosting security features. Specifically, UUNET is adding support for IPSec — the IETF's standard for IP encryption, authentication and key management.

Expected in July, IPSec support will be added by using Indus River's Linux-based River Works VPN products. River Works includes a VPN

access device that sits at a customer premise site and an IPSec-compliant client that will be deployed on each dial-up user's computer.

UUNET will support the River Works software client only for users who also have deployed RiverWorks devices. But the ISP plans to team with a security software vendor to provide all of its dial-up users with an IPSec-compliant client by year-end, says Dennis

security ISPs have been offering, he says. "In the long term we expect [strong security] services to become available. Until then, we are managing our dial-up users internally," he says.

In July UUNET will also offer Nortel's Contivity Extranet Switch product family, which supports standard tunneling, security, authentication, directory, accounting and connectivity protocols in

to rolling out its own PKI that will allow the ISP to support X.509 digital certificates used to authenticate users and network access devices. Digital certificate support will be just another option that UUNET's dial-up VPN users can add to their service. While UUNET has not committed to a specific vendor's PKI system or third-party digital certificate authority, the company says it will make those decisions by the fourth quarter.

Besides adding better management features and stronger security, UUNET has been busy cleaning house. UUNET has inherited assorted dial-up VPN services through a series of acquisitions. The services, such as SafeReach IP, SafeReach NT and ExtraLink Remote, will be woven into UUDial.

The change means some customers may have to swap out customer premises equipment. For instance, MCI WorldCom Advanced Network's SafeReach IP customers were using Layer 2 Forwarding to support secure communications between dial-up users and a headquarters site. But now UUNET is supporting Layer 2 Tunneling Protocol as a standard part of its UUDial service. SafeReach IP users will get a new Firewall-1 server to replace an ANS Communications Key Ring firewall server that UUNET will no longer support.

Because UUNET now comprises legacy CompuServe Network Services, ANS Communications and MCI WorldCom Advanced Networks, UUNET had to keep track of too many dial-up services, TeleChoice's Zines says.

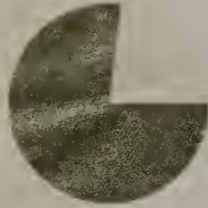
UUNET: (703) 206-5600

## What matters in a VPN

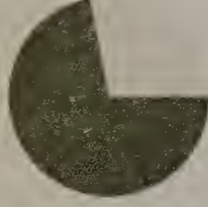
According to a recent survey of 501 users, the following features are "very important" in a VPN.

Percentage of respondents:\*

Performance 77%



Security 72%



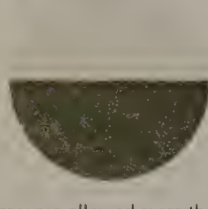
Ease of use 62%



Vendor experience 52%



Price 50%



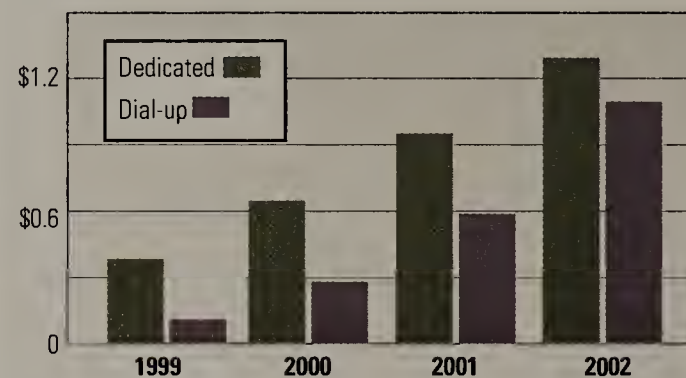
\* Users were allowed more than one response.

SOURCE: NETWORK WORLD/TELECHOICE VPN MARKET REPORT

## VPN services gain momentum

The amounts spent on dedicated and dial-up VPN services are expected to grow significantly as these packages offer stronger security and management features.

In billions



SOURCE: THE YANKEE GROUP, BOSTON

Brouwer, vice president of dial-up services at UUNET. Once UUNET chooses an IPSec client, all of its dial-up VPN customers will be able to support the strongest encryption and authentication available. Until then, users can use the River Works products or wait a few more months.

Users at BMW Manufacturing are happy to see the IPSec support. BMW, a UUNET dedicated Internet access customer, has held off outsourcing its dial-up VPN needs because of a lack of IPSec support.

"We want managed, worldwide dial-up access using IPSec," says Sim Wright, BMW Manufacturing's coordinator of IT. But BMW has not been satisfied with the level of

a single, integrated hardware platform.

The Contivity products as well as CheckPoint Software's Firewall-1, Windows NT and River Works servers will be included in UUNET's VPN Alliance Program, which the ISP is expected to announce later this month. The program will include several vendors' products that have been compatibility-tested and can be fully managed by UUNET in combination with its dial-up VPN services.

UUNET has also committed

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**Qwest,**  
continued from page 13

Forrester's Mines asks.

Nacchio compared the overall deal to last year's successful Qwest purchase of LCI International, a traditional long-distance carrier that helped Qwest break into frame relay, ATM and consumer long-distance. Qwest needs to put traf-

fic on its network, and "the easiest place to sell a next service is to an existing customer," he says.

Qwest's move puts the company in competition with Global Crossing for US WEST and Frontier. Therefore, any final deal — and the inevitably difficult regulatory approvals — are far down the road. Eileen Eastman, director of telecom

research at The Yankee Group, says in the end Qwest and Global Crossing may agree to "split the baby." One scenario: Global Crossing gets Frontier because it needs a U.S. long-distance network, and Qwest gets US WEST because it wants to dramatically increase its local loops of all types. But even that plan depends on Qwest's stock price holding. ■



# Bell Atlantic jumps into the VPN game

BY DAVID ROHDE

**NEW YORK** — Bell Atlantic last week announced its first all-IP virtual private network service, giving the RBOC's Northeast and mid-Atlantic customers another choice for branch office and remote user communications.

The new service, called simply Managed Virtual Private Network, is based on VPN hardware devices installed on customer premises, rather than a firewall or software-only offering.

In the initial version of the service, available this month, Bell Atlantic's Data Solutions

Group will configure, install and manage TimeStep's Permit family of VPN switches. Bell Atlantic will eventually add Nortel Network's Contivity VPN switch as a second option for dedicated access locations, says Bill Jefferis, Bell Atlantic's senior VPN product manager.

For remote and mobile users with dial-up access, Bell Atlantic will provide an IP Security (IPSec) software client and use Data Encryption Standard or triple DES encryption. Device and user authentication will be performed via X.509 (Version 3) digital certificates.

Bell Atlantic did not release complete pricing details but

gave a projected cost that reflects the fact that, like many other recent VPN announcements, this service includes fees for ongoing carrier management rather than pure transport. Bell Atlantic will charge \$1,095 per gateway device if connected to Bell Atlantic's IP network and \$1,195 per device on another service provider's network. (Bell Atlantic is offering the service outside its region under its ability to provide unrelated services beyond its boundaries.) That's in addition to the actual cost of the dedicated access line, such as a T-1. Plus, a 500-user "client pack" including the IPSec software

will cost \$4,495 if spread over six sites.

Bell Atlantic did divulge some service-level agreements for Managed VPN. The company will promise dial-up users 97% network availability, and the carrier will provide an initial modem speed of 26.4K bit/sec 99% of the time.

Unlike many regional Bell operating companies, Bell Atlantic is taking advantage of its ability to provide unregulated services outside its home region to encourage its customers — especially in the financial and health care industries — to add users nationwide to the VPN network. One challenge Bell Atlantic may face down the road: If the government approves its proposed merger with GTE Corp.

— which has a much more dominant role in the Internet with its GTE Internetworking unit — Bell Atlantic will likely have to integrate its Managed VPN with GTE's VPN Advantage service. ■

## More Online

- An overview of GTE's VPN offerings.
- More on the Permit switches that Bell Atlantic will use.



**QoS**,  
continued from page 1

president of consultancy Net-Reference, also in Sterling.

The VPN tunneling and encryption-standard IP Security (IPSec), for example, encrypts both the payload and header portions of an IP packet, Freeman says. The header contains the type of service (ToS) field where QoS services — such as Differentiated Services (Diff-Serv) — reside.

"Any ToS bits that have been set are scrambled" by IPSec, Freeman says.

Likewise, if the VPN is set up using the common tunneling protocol called Layer 2 Tunneling Protocol (L2TP), the network being tunneled through may have trouble figuring out what QoS to grant to what applications. That is because the L2TP protocol does not address how to ensure QoS via Diff-Serv or the IETF's Multiprotocol Label Switching (MPLS) standard for traffic engineering.

Vendors are circumventing the problem by mapping ToS bits within the encrypted header to an unencrypted, or "clear text" header ahead of the

tunneled packet. Cisco has been shipping this capability in IOS 12.0 since January, says Richard Palmer, vice president of marketing for Cisco's Enterprise line of business. Likewise, Nortel Networks started shipping the clear text feature in Version 2.5 of its Contivity Extranet Switch software earlier this month, says Bruce Perlmutter, a Contivity product manager at Nortel.

But there are two problems with the workaround, analysts say. One, it's not standard, so QoS may not be consistent in a public network with multi-vendor switches and routers.

"It's a lot easier if you've got it all integrated into one platform," says Karen Barton, vice president of marketing for VPN switch vendor Xedia in Littleton, Mass. "If you have two different pieces of equipment on either end of the VPNs . . . we couldn't make any representation about the ability to provide a QoS guarantee to the applications on the other side."

The second problem with the clear text header approach is that it provides network-level QoS, not application-level QoS, using service-level policies. Application-level QoS is vital for service-level agreements (SLA) between enterprises and service providers that guarantee the response time of mission-critical applications.

"The only guarantees service providers are making are with respect to network transport," says John Morency, an analyst at Renaissance Worldwide in Bedford, Mass. "You're not going to

get the end-to-end QoS you're looking for."

Application-level QoS information typically resides in the TCP/UDP port number field of the IP packet, which is deeper within the packet than the IP header. If this information is left unencrypted, it's an invitation for hackers, analysts say.

"Now I know what packets to look for if I'm targeting a specific application," Freeman says.

### Could MPLS be coming to the enterprise?

Page 30.

Get a primer on how LAN to WAN QoS mapping works. Page 53.

"It does compromise security."

Right now, service providers are throwing bandwidth at the policy-based VPN QoS encryption problem. For example, Concentric Networks uses Xylan gear to queue traffic according to policies before the traffic is encrypted and sent across Concentric's backbone.

The backbone has to be engineered with ample bandwidth so traffic doesn't encounter congestion that increases delay and disrupts QoS.

"To do SLAs today, we just throw more capacity at it," which is inefficient, says John Lawler, Concentric's product line manager for VPNs. The IETF is currently working on ways for service providers to simplify their VPN QoS schemes.

Some vendors and analysts say label switching schemes, such as the IETF's MPLS, solve the VPN QoS problem because they create closed user groups in which certain sites are only able to communicate with certain other sites. Therefore, encryption is not needed, they say.

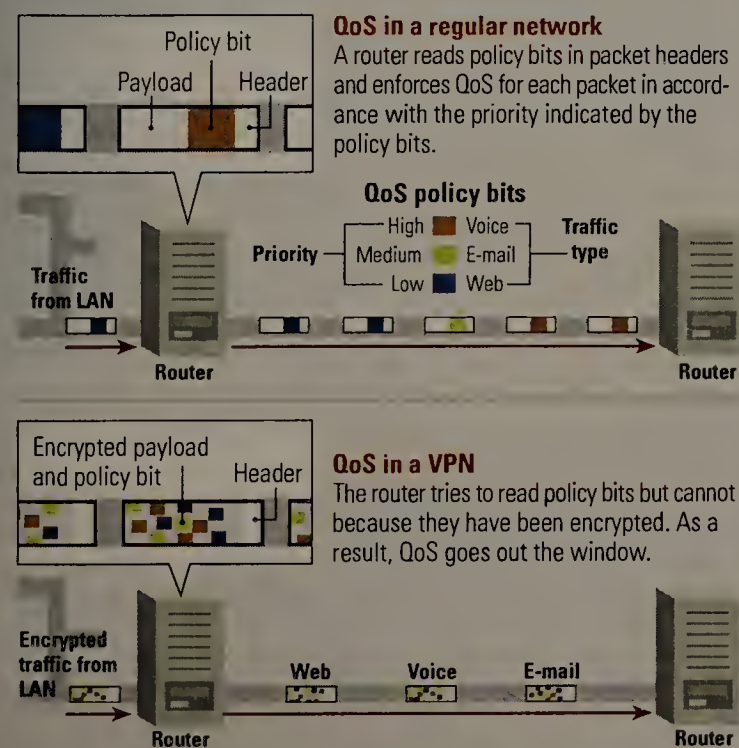
Still, there will be some enterprises that insist on tunneling all VPN traffic. And things could become even more complicated when Microsoft releases Windows 2000, which is currently undergoing beta testing.

Windows 2000 calls for using L2TP and IPSec, which Microsoft says are valuable for encrypting and tunneling non-IP packets across an IP VPN. But this "double tunneling" shields QoS information from MPLS routers, says Greg Marcotte, vice president of marketing for Altiga Networks.

The only decisions the router can make would be based on the source and destination IP addresses as shown in the L2TP packet header. Individual applications between two IP addresses could not be given different QoS levels, Marcotte says. The IETF is considering two proposals to overcome this. One describes how two L2TP devices could negotiate a Diff-Serv indicator for dial-in users. The other describes how two such devices could negotiate an MPLS label. ■

## VPNs limit QoS

Encrypting packets for a VPN blocks quality-of-service (QoS) information from WAN routers.



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# Backspin

## Digressing retrospectively

<digression>Folks, this is a "Backspin" first: I am digressing before I get down to business.

Before I start, I just want to pick up on your comments on the column before last, to wit, my diatribe regarding Amazon.com ("E-comm: Love, trust and doing wrong," NW, June 7).

What a response! About as many people commented with the equivalent of "right on" as did those who commented with the equivalent of "%\*\$# off." The latter group, and I'm not exaggerating here, were more outraged over my comments than usual.

What do I make of this? Well, I suspect there were a number of Amazon.com shareholders in the group, but it does seem that those who feel strongly about

the issue feel very strongly. <sub-digression>One gentlemen wrote in what seemed to be great anger and concluded his message with, and I quote: "I think that you are big loser!" What can I say? "Gee, good argument, buddy"? </subdigression>

One of the right-on readers wrote to say the same thing had happened to her and to a co-worker. The lady had copied the message to Susan Robinson, Amazon.com's customer care and QA manager, and I followed the message with a copy of the column.

Robinson replied with a perfect response: Yes, they had a problem, she thought they had fixed it, she was now on a mission to boldly go, to seek, to destroy and, to... well, get it fixed. Excellent. No whining that I was subjecting them to cruel and unusual treatment, no blaming the dark side, no calling me a loser.

Now those of you who complained that I was holding Amazon.com to higher standards than their real-world counterparts were absolutely right. And so should you. A couple of you asked if I would complain if I were overcharged at the supermarket? What do you think? Of course, I would!

And if I found myself being overcharged frequently, I might well write to the store management. Unfortunately, in the real world, I can be overlooked. I can get shuffled into the circular file and there's not much I can do. But online, things are different. I, and you, can complain in a dozen different forums and lists.

Online, we can get action that can't be achieved in the real world and in doing so, we're doing vendors a favor: We're helping them to be better vendors — to provide better service, give better value and do more efficient business. And they need to be as good as they can be because the competitive pressures are far greater online.

My proof of this pressure, at least in the bookseller's world, can be found at <http://isbn.nu>. On this site, you can enter an ISBN number and get a list of the prices offered by a number of book vendors. I just checked this site for the book that started the whole thing (*Suits Me; The Double Life of Billy Tipton* by Diane Wood Middlebrook, a unique, amazing and very well-written biography).

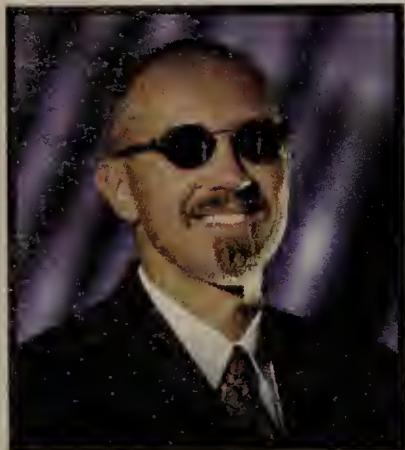
I found that Amazon.com's price (\$11.20) is matched by Barnes and Noble and Books-A-Million (although you can get it at a 10% discount there if you join their Millionaire's Club for \$5 per year), and beaten by 1Bookstreet.com if you take shipping cost into account (currently Bookstreet.com has a free standard domestic shipping promotion).

Under this kind of pressure — which is unlike anything in the real world — only the efficient, the accurate and the competitive survive.

And let us be clear: I think Amazon.com runs a terrific operation and despite my comments in the previous column, I will still be buying books from the company (price comparisons notwithstanding). </digression>

This week I want to talk about... damn, out of space. Oh well, there's always next week.

Competitive pressures to [nwcolumn@gibbs.com](mailto:nwcolumn@gibbs.com).



MARK GIBBS

# 'NET BUZZ



The latest on the Internet/intranet industry

**Attention all you would-be do-gooders:** The World Links for Development Program (WorLD) is looking for a few good network men and women — also gear and cash — to help bring the Internet into the lives of students in developing countries.

(Look, I promise this won't be preachy, but this genuinely is a worthy cause... and I'll try to make fun of someone so you'll know you're still reading Buzz.)

A philanthropic venture of the World Bank, WorLD's mission is to link students in developed countries that have Internet access coming out their ears with students in places such as Uganda, South Africa, Brazil and Chile. Most students in developing countries haven't a prayer of getting wired without divine intervention. Once connected, students and teachers from both groups collaborate on educational projects that are designed to benefit all, according to Linda McGinnis, co-manager of the program.

McGinnis says WorLD has garnered support from a number of U.S. technology companies — Sun, in particular — but not at levels one might expect from some of the wealthiest corporations on the planet. McGinnis says supporting a program such as WorLD makes good business sense for the tech giants, given that those countries benefiting foremost will be the hot IT markets of tomorrow.

"In altruistic terms, this is just complete apple pie," she adds.

Take it from one teacher who knows. Lawrence Ssenkubuge, who teaches math and physics in Uganda, says WorLD-provided Internet access has overcome his primary professional frustration: static, rote, even boring interaction with students.

"Now it is the students who have a chance to discover on their own, and the teachers are just guides," Ssenkubuge says.

The young people have been positively transformed, he adds.

"The students who hated learning are now pressuring us to give them a chance to learn," Ssenkubuge says.

Want to help? Check out WorLD's Web site at [www.worldbank.org/worldlinks/](http://www.worldbank.org/worldlinks/).

(Read more on McGinnis in *Network World's* upcoming You Issue, which will be published July 26.)

**In an online world in which mind share rules** and attention spans are measured in nanoseconds, you've got to like this 'Net start-up's brand-new name: **Bigstep.com**. The moniker passes my litmus test in that I could actually remember the dang thing 20 minutes after first hearing it from company founder **Andrew Beebe**.

Known as The Springfield Project before last week, Bigstep.com sees big bucks to be made by helping smaller companies make the leap onto the Web (get the name now?). U.S. Venture Partners and the Mayfield Fund just doled out \$10 million to back Beebe's brainchild.

Of course, targeting the small fry is by no stretch a Big Idea these days because virtually every IT vendor has a line in that pond. Beebe claims Bigstep will stand out by being "a one-stop shop" for site building and hosting, customer communication tools, transaction services, marketing assistance and, sometime after this summer's launch, visitor tracking and traffic reports. The package — price unannounced — will be largely self-service and browser-based.

"All those things embodied in one platform will be unique," he contends.

Which isn't necessarily the same as being in demand or profitable.

In preparing Bigstep.com's business plan, Beebe's team talked to 250 small-business people about what keeps their kind off the Web.

"Again and again they tell us, 'We don't know where to begin' or 'We don't have the time or the money for any of this,'" he says.

That's not likely to change, either, unless Beebe's new service is kindergarten easy-to-use and downright dirt-cheap.

You, too, can take that big step as a Buzz reader by sending McNamara your Internet gossip and news tips. Contact him at (508) 820-7471 or [pmcnamara@nw.com](mailto:pmcnamara@nw.com).



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**How IBM storage can help you.** | Network Storage Manager, an integrated disk and tape solution, features award-winning ADSTAR® Distributed Storage Manager (ADSM) software for automated backup and fast recovery of distributed data across major platforms. Disk, tape or optical, serial or fibre-based connectivity, nobody offers a wider range of storage tools, software and services.

Make the most of your data: [www.ibm.com/storage/tools](http://www.ibm.com/storage/tools)

 e-business tools



**You said you need a strong defense against unexpected network downtime.**

**ADTRAN delivers.**

**Cost-effective dial backup solutions for Frame Relay and dedicated wide area networks.**

When the circuit goes down, and anxiety starts rising, you'll remain calm. Because with ADTRAN termination equipment in your network, your connectivity solution includes comprehensive disaster recovery capabilities. More proactive than router-based recovery plans and more cost-effective than carrier-based methods, ADTRAN's dial backup solutions give you exactly what you need to prevent expensive downtime and keep your network operational. Whether your network is packet or dedicated, you're protected — even on monitored Frame Relay circuits. Modular, field-installable dial backup cards instantly bypass an inoperative circuit — with no technician, no lost time. Don't go another day without it.

*Proactive disaster recovery solutions from ADTRAN*

Visit [www.adtran.com/recovery](http://www.adtran.com/recovery) for a free white paper on disaster recovery. Or, call 877 399-7541 (toll-free) and request a free copy of ADTRAN's disaster recovery brochure.

Cost-effective dial backup solutions for packet and dedicated networks

V.34 analog, Switched 56, and ISDN BRI and PRI options

Dial backup around monitored Frame Relay networks

Protection from physical line, LMI, and PVC failure

Available for ADTRAN integrated access systems, Frame Relay performance monitoring and access devices, T1 multiplexers, and 56k to T1 DSU/CSUs

Simple, field-installable cards

**Experts choose ADTRAN.**

**ADTRAN**